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ABSTRACT

An undergraduate psychology course which relied on readings instead of textbooks and which required extensive notetaking was the environment for a study of microform utilization. The material for the course was made available in hardcopy and was also reduced 150x onto a 4 x 6 inch microfiche. Four microform readers were made available for on-campus use. The motivation for sustained use of microforms in preference to hardcopy was the perceived value of the complete information. Microform use patterns were compared with hardcopy use patterns over the 10-week period of the course. The major result was the determination that microforms can be used to support a course which requires that information must be abstracted and retained by the student in order to pass the course, although the additional demands made on some students by the machine presentation were observed to offset the value of the complete information unit, and use of the microform readers by these students terminated. The vertical formatting used to arrange material on the fiche proved to be quite successful. Physical fatigue and eye fatigue were the most common student complaints about the microform readers. It was also determined that a user should have as much control as possible over the environment in which the microform reader is used. (JY)

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FINAL PHASE REPORT

AN INVESTIGATION OF THE ENVIRONMENT FOR EDUCATIONAL MICROFORM UTILIZATION

(Continuation of Contract No. OEC-0-8-080826-4648(095))

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"STUDENT USE OF CLASSROOM MICROFORM IN SUPPORT OF A CONTENT COURSE"

James P. Kottenstette
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SUMMARY

This report completes a three-year program of research in educational microform utilization conducted at the University of Denver. The investigation reported here examines student behavior and identifies user requirements when microform is employed as the primary medium of communication in support of a "content"-type course of instruction.* An undergraduate course entitled "Sensation and Perception," taught in the Department of Psychology, formed the environment in which frequent and continued microform use by a large student group was observed. The question "Can students routinely utilize a microform presentation to meet their perceived information needs?" was central to the research.

Approximately 1400 pages of information, from varied sources, including one complete book, journal articles, and reference materials, were filmed on one 4×6-inch fiche. These materials were made individually available to 53 students. Four viewers (film readers) were made available to the students for on-campus use. Two were installed in the Microform Reading Room of the University Library where the hardcopy form of the material was also available "on reserve", and two were located in a laboratory of the Psychology building.

Microform use patterns were compared with hardcopy use patterns over the 10-week period of the course. The motivation for sustained use of the microform was derived from the perceived value of the complete information unit. This experimentation minimized the convenience aspect as a motivator since student users had to go to the library (or the campus) in order to obtain the materials in hardcopy or to use their microforms. In addition to the determination of use patterns, a series of observations and subjective measures were employed to refine the concept of routine microform utilization.

The major result of this study was the determination that microform can, indeed, be used to support a course of instruction where the filmed information must be abstracted and retained by the student in order to meet classroom requirements. While the major result indicates the viability of the microform concept, the additional demands made on some students by the machine presentation were observed to

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* Complementary research has been conducted in support of a "survey" course. The report is identified as: Phase I, "Student Use of Classroom Microform in Support of a Survey Course" (30 April 1971).

offset the value of the complete information unit, and use of the microform by these students terminated.

The report considers a number of important elements in educational microform utilization ranging from environmental requirements to student insights on system optimization. However, the significant accomplishment in this work was to operationalize a distinction between "study" uses of microform and "reference" uses of the form, the latter being most characteristic of present library requirements. This distinction can be the basis for a more effective design of library microform equipment.

INTRODUCTION

For the past three years, the Denver Research Institute has conducted an extensive research program which was designed to explore applications of microforms in colleges and universities. While the administrative value of microforms is broadly recognized, the approach selected to implement this program focused upon the needs of the student user. The identification of these needs, together with a careful evaluation of the student-machine interface, as reflected in performance preference, and attitudinal characteristics, was the focus of the research. Results obtained from the early phases of this program provided several insights which are essential to an understanding of the focal considerations in the present study.

Background

Kottenstette (1969) determined in a reading experiment that there are no fundamental physical or psychological barriers to the utilization of microforms in the communication of information that the student customarily encounters in hardcopy. Students are able to preserve skill levels (reading rate and comprehension) when utilizing machine presentations of both descriptive and abstract materials which reflect various levels of difficulty. In addition, it was found that student performance is independent of reduction ratio (examined at 40X, 115X 150X) and virtually equal to that obtained using hardcopy presentations.

Secondly, it has become obvious that screen presentations of textual materials can be of excellent quality throughout a wide range of reduction ratios up to 150X. In fact, an image presented at 150-times magnification compares favorably in readability with the original hardcopy material that was filmed. This means that educational applications of ultrafiche are not limited by the present state of reproduction technology. They <u>are</u> limited, however, by the requirement that a "machine-reading" application must have intrinsic value to the student, and not be applied solely because of certain administrative virtues.

Finally, as the data obtained from these earlier studies were analyzed, it became apparent that the possible educational application of microform could be quite inclusive rather than restricted to specific "areas" of application such as library reference materials.

Microforms' Role in Education

These results all support a basic contention that microforms could very well play a valuable and expanding role in educational pursuits, and in the educational process itself. However, microforms, as presently encountered in the institutional setting, serve a limited user group and the use is exceptional rather than routine. This distinction between exceptional and routine use is an essential one. Routine use implies frequent and continuing use of the microform in satisfaction of individual information needs. It deals with the fundamental difference between a system used once by one hundred people as opposed to one person's using the system one hundred times. Microform materials are widely distributed in the educational environment at this time, but for purposes which are generally consistent with limited usage: e.g., research, archives, back-issue maintenance, storage, etc., and with a limited user group.

The phrase "microforms in education" carries the implicit idea of broad usage on a routine basis. This emphasis on routine use as an application criterion necessitates a more detailed examination of the environmental considerations involved in the implementation of a microform system. An application anticipating exceptional or restrictive use is not required to respond to the entire range of considerations that are involved in an application based on routine use in which repeated and continuing use is anticipated. Exceptional use implies a great need and high motivation which can overcome system defects; in normal educational applications, on the other hand, the primary motivation for using a microform presentation can arise only from the information needs of the student as perceived by the student. The continuing nature of these information needs does not sustain the high motivation necessary to offset system defects.

Routine use and a broad base of users proposed for educational microforms requires that the student himself be the primary focus of any microform system development for educational application. If the role of microforms in education is to improve, the concepts inherent in developing a broad user base specify the point of departure from present limited systems. One major step in this departure is the development of operational or real-life situations in which microforms can be used to support a range of educational activities. The classroom is a major student contact point which was examined in order to recognize the factors that positively or negatively affect routine use.

Routine Use Supporting Classroom Requirements

The present study phase was designed to shift the experimental emphasis of the educational microform investigation from the man-machine interface to routine microform utilization in direct support of educational activity. The classroom situation provides a point of departure because student information needs, based on the instructor's definition of course material, modify the man-machine interaction which was studied in the laboratory. This report considers microform use, in one classroom situation, in order to provide experimental insight into the following considerations:

1. What is the nature of student use patterns when both microform and hardcopy are equally available through the library facilities?

2. What are the physical characteristics of routine use of microform when a student is expected to "study" the information presented via microform and be responsible for its content?

3. What are the factors that positively or negatively affect routine use of microform?

Classroom and Course Characteristics

The selection of the course to provide a vehicle for this experimentation was as much circumstantial as it was the result of design. The original requirements for the experiment were:

1. a relatively large student group in one class,

2. an undergraduate-level course,

3. reliance on "readings" instead of the usual textbook(s), and

4. a situation in which the students systematically study, abstract, and retain the readings in order to successfully complete the course.

The latter requirement forms the basis of distinction between a "survey" type course and a "content" type course. At a minimum, a survey course implies that the student be familiar with a wide range of

materials, authors, and their concepts; a content course implies systematic learning of principles and procedures.

An undergraduate psychology course dealing with the subject of "Sensation and Perception" was selected and a syllabus was developed with the cooperation of the instructor. The program was unique because the instructor attempted to meet two different types of student needs in the course design. The class was informally divided into two sections which met concurrently. The sections were developed on the following basis:

> One section was recommended for students who had no plans for advanced work in psychology but who sought a liberal education. This program consisted of reading the assigned material and attending discussion sessions on that material. Five quizzes covering the readings, in addition to a midterm and final examination of a comprehensive nature, were given. Thirty-five students enrolled for this "reading and discussion" section.
>
> The other section was recommended for students who expected to do future graduate work in a behavioral science. This "pre-professional" program included readings, lectures, and laboratory work which emphasized contemporary theory and associated research, most of which employed mathematical models and quantitative methods. Midterm and final examinations were given. Eighteen students enrolled for this Pre-Professional section.

Operationally, the difference between the instructional approach for the two sections reflected the extent of student experience. The Pre-Professional section met separately twice each week; otherwise, the classes were held in common. The Pre-Professional group was responsible for the same materials as the R&D section, but additional readings and participation were required in order to more completely prepare the students for the graduate program. However, assignment to a section was based solely on the student's perception of what he wanted from the course. (See Appendix A for a more complete description of the two sections.)

A total of 53 students, primarily Juniors and Seniors, were enrolled in the course (Spring quarter, 1970). Each student was given a single ultrafiche which held all of the course materials. The inducement to use the microform system was limited to a thorough explanation

of use of the film and the viewer, together with an explanation of the experiment and its objectives. The students were asked to record their use of the instructional material, regardless of form (either the microform or the hardcopy), but there were no other conditions to their participation in the experiment.

Primary Objective

This introduction to the concepts and scope of the reported experimentation would be incomplete without the following qualification being well understood by the reader: the research reported upon was not intended to be an educational performance comparison nor to be a controlled behavioral study. The objective of this work was to provide first insights into questions of "broad and routine use" of educational microforms in support of a "content"-type course of instruction.

METHODS

Materials and Equipment

The viewers (or readers) utilized in the experimental phase of this program were obtained from the National Cash Register Company of Dayton, Ohio, which also provided the necessary filming. These viewers were the PCMI models (Figure 1) that operated at 150X magnification. There were several considerations involved in the decision to utilize this reduction ratio.

The selection of a type of microform for any application should be based primarily on the nature of the required information and on the constraints and limitations of the form itself. Previous studies conducted by the Denver Research Institute have demonstrated that although a quality differential is detectable in individual character recognition or visibility at high reduction ratios, a quality image presented at 150X magnification compares favorably in readability with the original hardcopy. Most educational applications of microforms are consistent with a need for high readability of the machine presentation and these early studies demonstrated that current technology can preserve readability at high reduction ratios.

Another study phase examined the role of reduction ratio while comparing reading performance on viewers with performance obtained on hardcopy. Reading rates and comprehension were found to be essentially equal to those obtained on the hardcopy as well as being independent of reduction ratio.

The implication of these results is compelling; if reduction ratio itself is not a limiting factor, the selection of the microform used should be based on the characteristics of the information to be reproduced. Since the materials for this course were gathered from several volumes and periodicals, the ultrafiche form was selected in order to preserve the integrity of the filmed documents (book-length materials, specifically). The potentially high frame-density of the ultrafiche form permits entire works, or multiple related works, to be placed on a single fiche. In addition, the ultrafiche has both vertical and horizontal components of image placement for the organization of information, which permits the user rapid access to any of these pages merely by moving the fiche slightly.

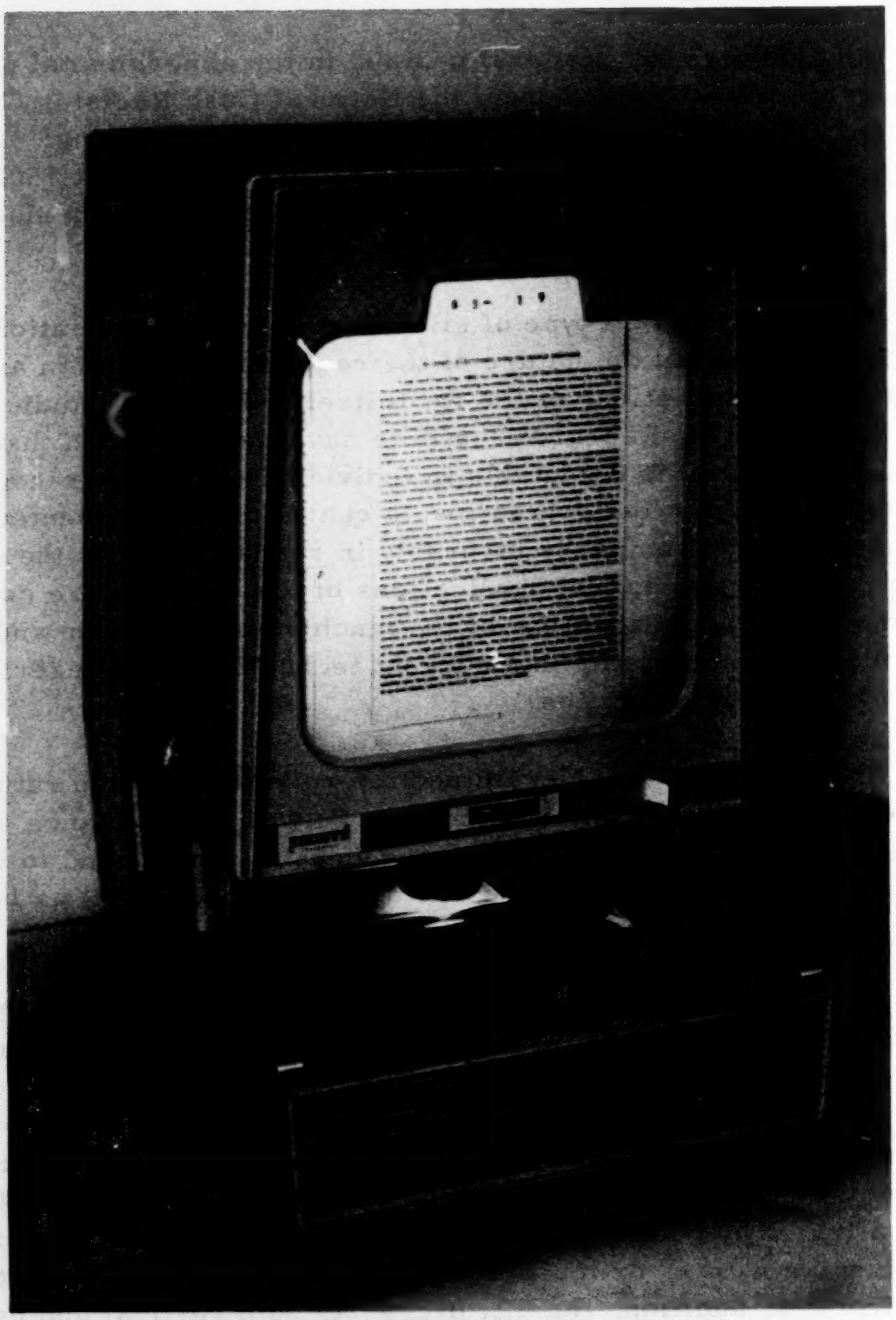

Figure 1. The PCMI Ultrafiche Viewers. Four of these Viewers were available for the experimentation

The microform used in this experimentation is shown in Figure 2, with the major course topics identified in blocks of images as indicated. The block labeled "contemporary" represents the additional material required of the Pre-Professional section. The 4×6-inch film chip is capable of holding 3200 images. The course material encompassed approximately 1400 pages, including one entire book, 18 chapters from 5 different source books, 13 articles from 3 books of readings, and 5 articles from current periodicals. (See Appendix B for complete bibliography.) The students had access to the textual material for the course in two forms: the course material was available in hardcopy books and periodicals held "on reserve" at the University Library, and each student received all the course material (regardless of which section he chose) in ultrafiche form.

The single ultrafiche, at 150X, was formatted vertically such that each chapter and/or article began a new column. The entire first row of the fiche (i.e., the beginning of each column) repeated the index to the fiche and had an arrow indicating "present" column position. This formatting organization was particularly effective because most (86%) of the individual items in the course material could be contained entirely within the 40 frames of a single column. Such formatting made precise framing quite easy since the film carriage in the viewer could be centered upon a column and merely pulled toward the user as each page was read.

The viewers were located in two places on campus: two viewers were available in the Microform Reading Room at the University Library, and two others were located in a special reading room in the Psychology Laboratory. These viewers were used during normal operating hours for the Library and the Psychology Laboratory. The convenience of access to the viewers, and the hardcopy, was essentially equivalent: both modes demanded that the student be "on campus".*

Each reader station was monitored daily for: (1) the duration of each transaction, and (2) the name of the author of the particular article or articles being read during that time period. The hardcopy transactions in the Reserve Room were monitored daily for: (1) how long used in each transaction, (2) the name of the author of the

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* Convenience of access was found to be an important force in sustaining microform use. See Phase I reported under this contract regarding a survey course in which students had access to viewers in their residences.

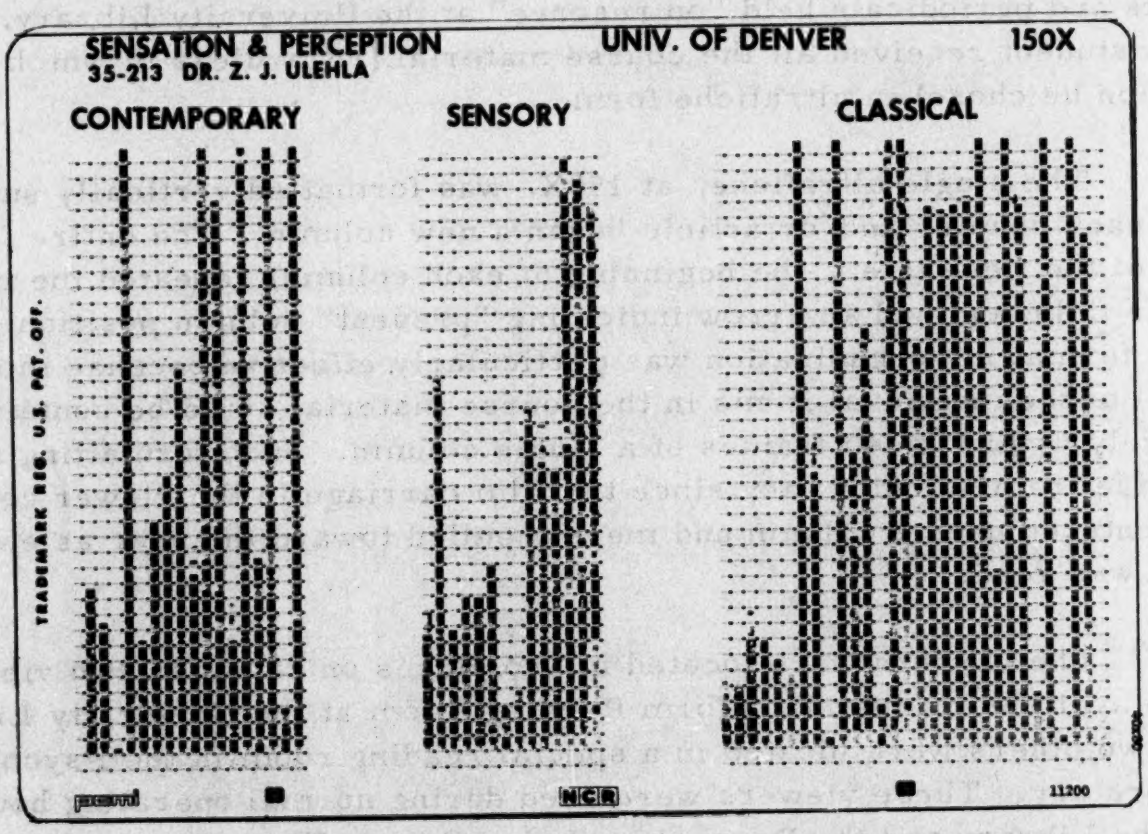


Figure 2. Ultrafiche Supplying the Material Used in Support of a "Content" Course of Instruction

particular article being read during that time period, and (3) whether or not the student xeroxed any material. In addition to these monitoring forms, a post-class questionnaire was administered to consider student performance and attitudes toward the system, environmental parameters, and the organization and quality of material on the fiche. (See Appendix C for monitoring forms and the questionnaire.)

In order that the students should feel free to give honest and accurate responses during the ten weeks of this study, the data from the forms filled out by the students and the data obtained on the final questionnaire were collected anonymously so that no individual student was identified with a given response. The responses from these forms were compared daily with the check-out records kept by the Reserve Room and with the recording meters attached to each machine (which tabulated the total amount of time elapsed and the number of times the readers were turned on). These secondary sources confirmed that, for this study, the anonymous approach to data collection was extremely effective since an almost one-to-one correlation was established in accounting for student transactions with the course material.

The Questionnaire

The post-course questionnaire was an extremely important feedback tool for the evaluation of this experiment. The results of this evaluative procedure have been treated in two ways. First, where questions and responses could be effectively aggregated in clarification of the results reported, this collective approach was employed. However, in certain areas where student insights were probed, a second approach was also used in which each individual response was reported. These responses, to eight separate questions, are tabulated, in unedited form, in Appendix D. The responses are organized by the amount of microform use estimated by each student. A consistent designation has been employed for each student so that individual responses can be compared (i.e., RD16 identifies one particular student in the reading and discussion section of the class). This reporting approach has been taken in order to preserve the individual experience of a unique group of experimental subjects. This group of students represents hundreds of hours of microform experience in satisfaction of perceived information needs; their comments and reactions provide fundamental insights into the problems and challenges that must be met if routine educational use of microform on a broad scale is to be achieved.

RESULTS

Use Patterns of the Microform System and the Reserve Room System

The use patterns observed in this experiment were complex. First, nearly one-third of the class either did not use the microform system at all or used it only once. These students formed an initial use base for the Reserve Room while the remaining two-thirds of the class formed the initial use base for the microform system. Second, as the 10-week quarter progressed, students using the microform system slowly reverted back to hardcopy use offered by the "reserve" system. Finally, the overall use patterns of both systems were strongly affected by the political and social crisis (Kent State) which occurred during the middle of the quarter.

Comparative use patterns are shown in Figure 3, in which the total uses (i.e., transactions with either film or hardcopy) are shown for 7-day intervals. For instance, during the first week of the course, the fiche viewers were used 39 times and the Reserve Room was used 16 times. The total number of transactions on the microform system during the 10-week period was 257 with a total duration of use amounting to 333 hours. This measure of total duration is conservative since the value was determined by summing the individual time estimates which each student recorded with each film use, and it is about 10% lower than the time recorded on interval clocks associated with each viewer.

Table I presents the breakdown of microform use between the two class sections and includes approximate estimates of the total time of machine use based on 50 student responses through the questionnaire. For instance, four students in the R&D section and one student in the Pre-Professional section estimated that 20% of their study time, over the 10-week period, was associated with microform use. This estimate is approximately equivalent to five hours of machine time. This table, in conjunction with Figure 3, shows the change-over from microform use to Reserve Room use during the 10-week period inasmuch as the microform was used early in the period, characteristically.

Data concerning the length of time students used the two systems were analyzed in two segments: those collected before and those collected after the midterm examination. Table II indicates that the average time spent reading a single article was 61 minutes on the Reader-Fiche system and 68 minutes in the Reserve Room. The observation that the average reading time for one article was <u>longer</u> in the Reserve Room than on

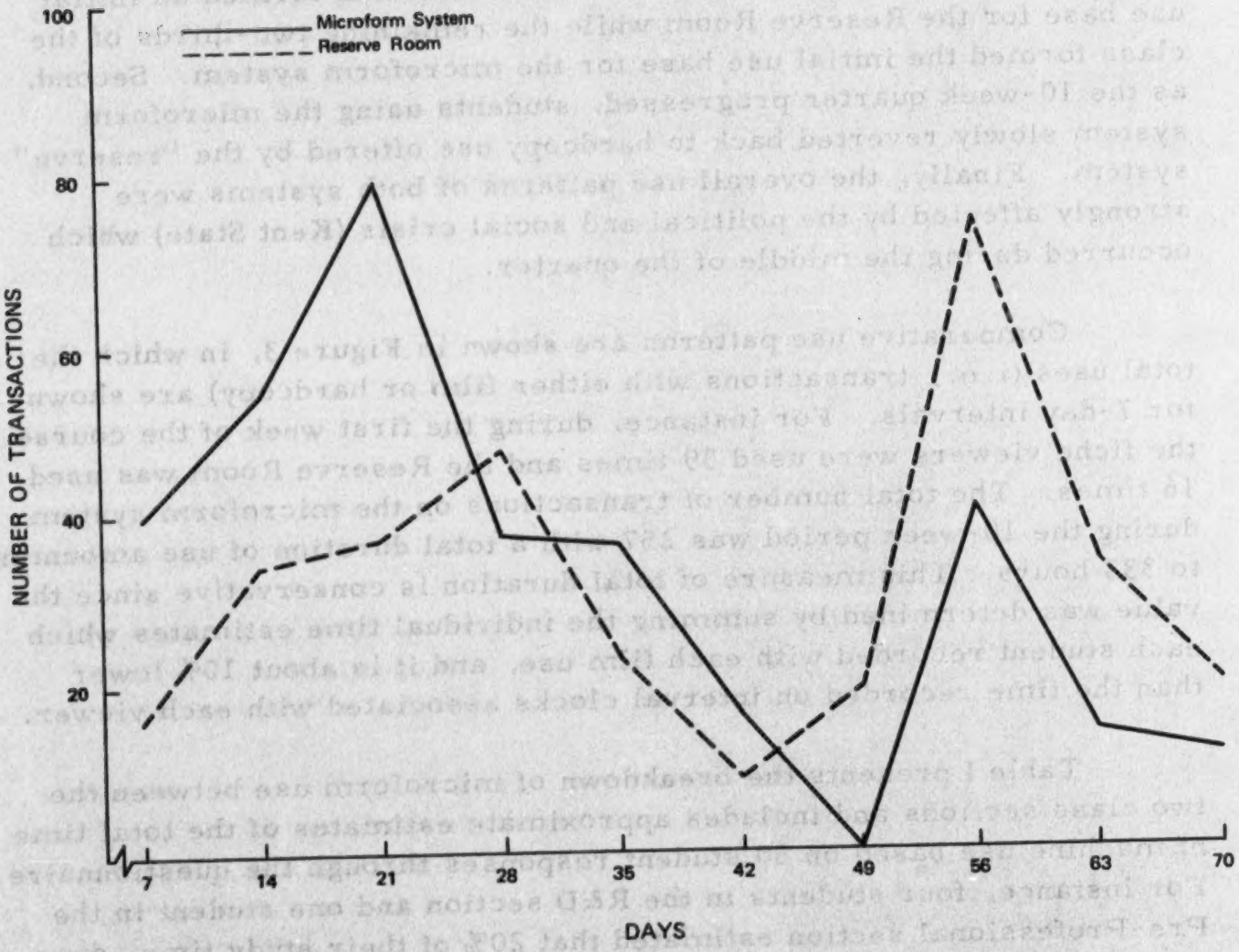


Figure 3. Student Transactions With the Reader-Fiche System, and the Reserve Room System, for 7-Day Periods*

* Note: Normal classroom sequence was disturbed between the 38th and 52nd days of the school term. (Kent State)

Table I. Student Estimates of Microform Use

Estimated Time*	Use Hours**	"R&D" Group N = 34 Students	"Pre-Professional" Group N = 16 Students
Not at all		2	4
Once		5	5
10%	2.5	9	2
20%	5.0	4	1
30%	8.0	1	0
40%	10.5	4	2
50%	13.0	0	0
60%	15.5	2	0
70%	18.0	1	1
80%	21.0	5	1
90%	24.0	1	0
100%	26.0	0	0

* Percentage of total time spent studying.

** To determine what the percentage estimates might mean in terms of approximate number of hours spent using the viewer, the individual estimates were added together and divided into the total amount of time accounted for by the Viewer-Fiche system (333 hours). The "rounded" results obtained from this procedure are listed under "hours" and should be recognized as being approximate estimates of the number of hours spent by an individual student using the viewer during the entire school term; given the fact that these are averages, it may be that a student who stated that he used the system for 90% of his total time spent studying may have used the viewer for as little as 20 hours or as much as 30 hours.

the microform system is especially interesting because the students tended to read more than one article each time they used the viewer. This difference in behavior is shown in Table III where the microform system and the reserve system are compared in terms of articles read per transaction.

Table II. Number and Average Time Spent Reading Each Article

	Microform System			Reserve Room System		
	Articles	$\bar{X}$*	SD	Articles	$\bar{X}$*	SD
Before Midterm	261	61.5	38	166	67.8	36
After Midterm	65	60.8	40	147	68.4	37

* Minutes per article

Table III. Articles Read Per Use Period

	Microform System				Reserve Room System			
	Transactions*	$\bar{X}$**	SD	Average Articles/T	Transactions*	$\bar{X}$**	SD	Average Articles/T
Before Midterm	209	76.9	42	1.25	158	71.2	37	1.05
After Midterm	48	82.2	43	1.35	134	75.0	37	1.10

* Transaction = a student using the system for one or more articles.

** Minutes per transaction (total time per use period).

The fact that this behavior was repeated during the last half of the quarter gives the result additional significance; apparently once the student began to use the viewer, there was a tendency to try to "finish up" a set of readings rather than simply return to the Library to read the articles one at a time, as evidenced by the Reserve Room ratio of articles-to-transactions. The tendency toward shorter average times to read a film article is a consequence of variations in the mix of readings during the 10-week period rather than a real performance difference between microform and hardcopy use.*

* Reading, in this context is understood as that activity in which the student studies, abstracts, and otherwise prepares the textual material to meet classroom requirements.

In order to understand the severe drop in use of the microform system, and the reserve system evidenced in Figure 3, the temporal correlation between the decrease in use and the events of the first week of May 1970 should be noted. Beginning on April 30, a series of national political and social crises deeply affected student life; for approximately two weeks the University of Denver was not functioning normally.

These changes are reflected in student responses to a post-course questionnaire in which the following question was posed:

> "Until the Cambodian-Kent State crisis (which corresponded to the midterm for this class), the use of the Reader-Fiche system and the Reserve Room was high. Since that time, use has deteriorated. Can you give any insights into why?"

The answers gave a good indication of the nearly total involvement of the students with elements outside their normal school environment and are typified by the following responses: (See Appendix D, Question 8 for complete responses.)

> "Very difficult to concentrate and study during and immediately after the crisis. Whole campus was disrupted. Also, I know of several persons, myself included, who elected not to take one of the quizzes for various reasons."

> "Probably because many people are taking pass/fail and don't need to study as hard."

The fact of the turmoil on campus does not, in itself, explain the drop in use of the Reader-Fiche system. The problem may have at least two dimensions: (1) There is psychological evidence to suggest that people who are under great stress often react by behaviorally regressing (Cofer, 1964). This tendency to go back to formerly effective behavior patterns may account for the students who were moderate users of the microform system before the period of crises and who ceased to be users during and after these disruptions. (2) The microform system has certain physical limitations which tend to make use of the film very demanding (e.g., focus adjustments, positioning, etc.). The impact of these demands does not decrease with continued use, and, in fact, as the school term proceeded, the constraints of the system became increasingly apparent to the students.

The change in group behavior observed before and after the midterm examination was striking. The data in Table IV indicate that before the midterm examination each student performed each reading assignment; whereas, after the midterm exam, only 68% of the reading assignments were accounted for. These figures confirm the written statements by the students concerning the turmoil on campus, loss of interest, and the change in course requirements to a pass/fail system.

Table IV. Comparison of Student Use of the Microform System and of the Reserve Room

	Before Midterm	After Midterm	Total
Microform Readings	261	65	326
Reserve Room Readings	253	140	393
Totals	514	205	719
Total Potential Readings*	514	301	815
Percentage of Readings Accomplished	100%	68%	88%

* Total potential readings = each student interacting with each article once.

The central point to be stressed, however, is that hardcopy was available to the student whenever he chose to use it throughout this study, and no external incentive was given to stimulate use of the microform system. Unless the Reader-Fiche system could actually fulfill the student's internally generated information needs after the first use (which may have been motivated initially by curiosity), the use patterns of the system would have dropped to essentially zero. As evidenced by the data, this was not the case.

Use Patterns and Eye Correction. The fact that approximately one-half of the student group either wore glasses or contact lenses resulted in a significant experimental finding: of those students using the microform system for 10% or less of their total study time, four out of five wore corrective lenses. Of those students using the system more than 10% of the time, only one out of four wore lenses. The central difficulty in machine use for the students wearing glasses appears to be associated with note-taking. In order to take notes, a student wearing glasses must not only drop his gaze from the vertical screen to the note pad, but he must also tip his head so that the center of correction in the lenses can align with the note pad. The required exaggerated head motion effectively isolates the viewer screen from the note pad or any source of secondary material, a problem many students found untenable very early in the experiment.

Comparative Grade Performance

Since the data from the students was collected so that no individual student was identified with any given response, no direct comparison between grades and amount of microform use can be made. However, since the staff of the Reserve Room kept "sign-out" records which associated the names of the students who used the Reserve system with the individual articles read, it was possible to tabulate Reserve Room use with individual students. From such a tabulation, the class could be divided into those students who used the Reserve Room for 60% or more of the articles assigned (predominantly Reserve Room users) and those students who used the Reserve Room for 40% or fewer of the articles assigned (predominantly non-users of the Reserve Room). Of course, this latter group includes those who used the Viewer-Fiche system and those who perhaps did not use either system; therefore, designating the course grades from this group of students as representative of Users of the Viewer-Fiche system is conservative. The comparison of these two groups indicates that there were no significant differences in grades since the grade-point average for predominantly Reserve Room users was 2.41 and the grade-point average for predominantly non-users of the Reserve Room was 2.43.

Student Behavioral Characteristics during Machine Use

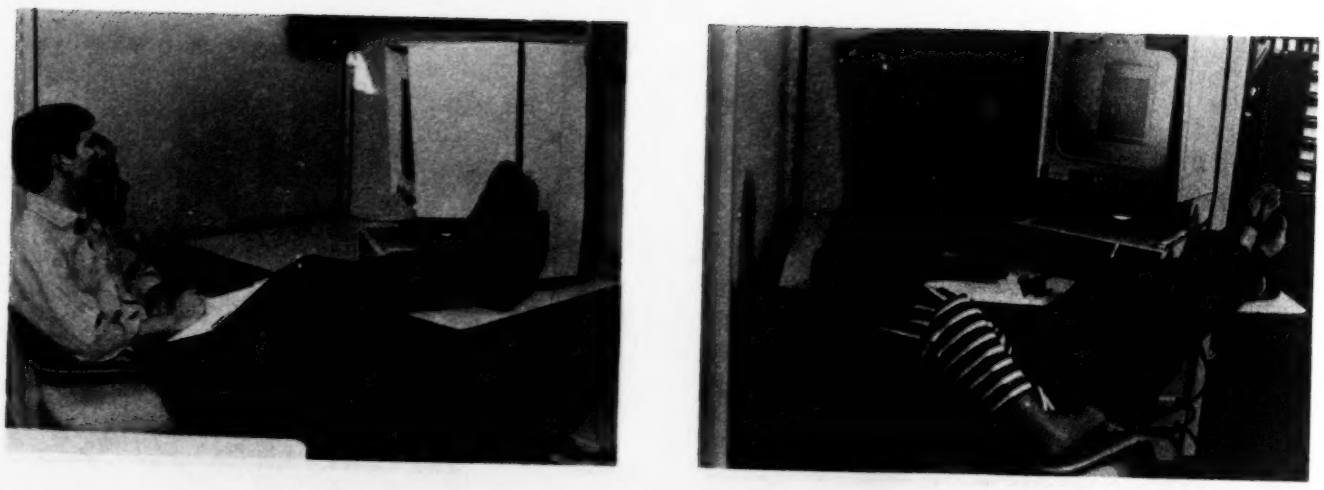
Over the period of ten weeks, the film viewers were used several hundred times by the students, with the average transaction or use lasting for more than one hour. This situation provided an opportunity to observe routine use of a microform viewer by a group of undergraduate

students having similar information needs which were satisfied by a common set of filmed materials.

The environment for these observations is shown in Figure 4, the Microform Reading Room in the Main Library at the University of Denver. Use characteristics were recorded through a series of candid photographs, some of which are recreated in Figures 5 and 6. In addition, certain questions of operating preference were developed through the questionnaire administered at the end of the 10-week period.

Figure 4. Viewer Environment in Microform Reading Room

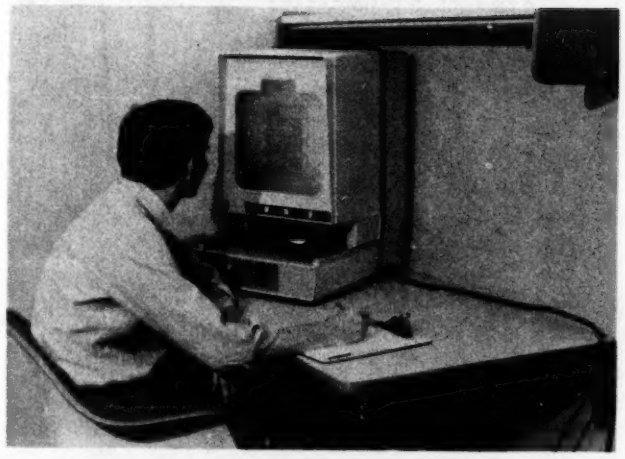
The photographs presented here demonstrate the most commonly encountered spacial relationships between the student and the viewer. These pictures are simulated in order to overcome a wide variation in ambient illumination actually encountered as the candid photographs were obtained. These illustrations summarize several important features of routine microform use. To the extent possible, the user attempts to achieve a harmony between himself and the machine. This attempt is characterized by the reading positions presented in Figure 5. The user strives for comfort and the positions shown reflect substantial adaptation. While the "feet up" position at first appears to be slovenly, it is, in fact, highly adaptive to the student's task; this position allows the user to minimize the spacial difference between the vertical screen presentation and the note pad. The problem of working between two



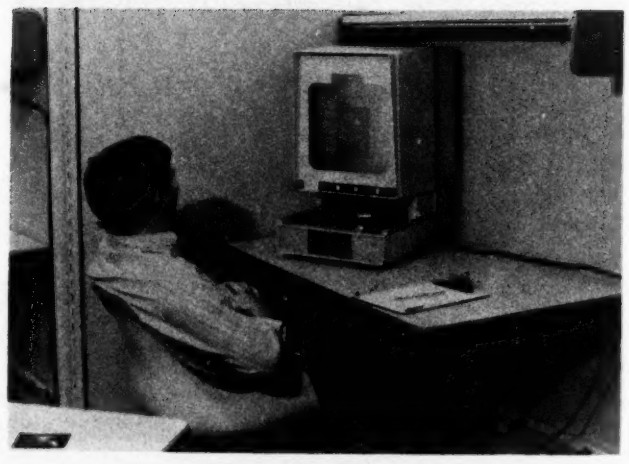
A Common Note-Taking Position

A Usual Reading Position

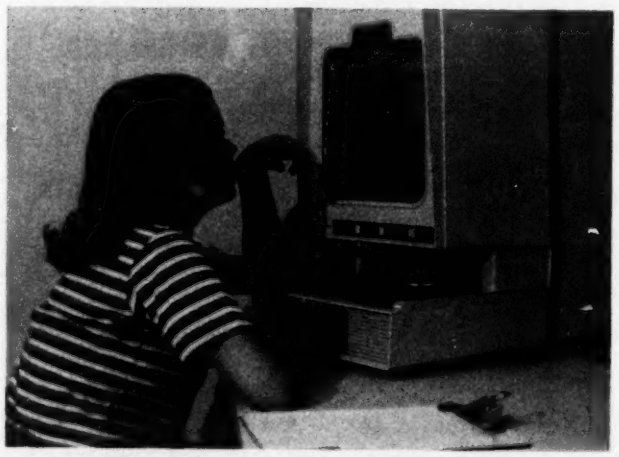
Figure 5. Use Relationships



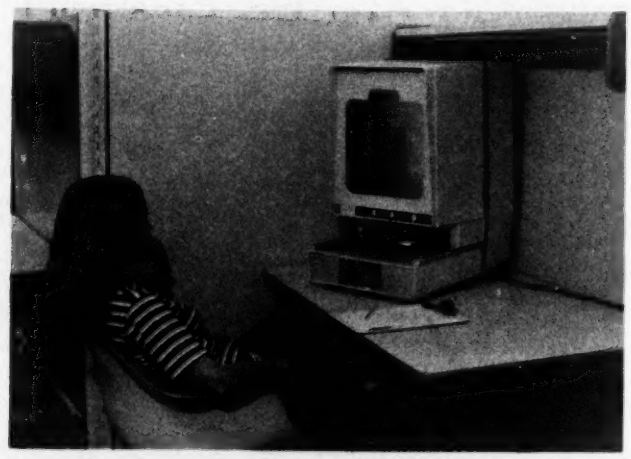
Finding Something to Record



Normal Position



Reading Small Type



Normal Position

Figure 6. Posture Changes

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unrelated display planes, i.e., the screen and the work surface, is largely overcome through this type of adaptation. One common student recommendation was to place the screen at tabletop level, tilted back about 45 degrees from the vertical, so that both the screen and secondary materials (i.e., the notepad) may be held in the same field of vision.*

One of the most important results of these observations concerns the unusually great distance between the screen and the user; distances on the order of 30 inches were commonplace. In fact, it was expected that the user would sit even further away if it were not for the need to reposition the fiche and focus the viewer. The type fonts filmed for some of the articles also affected position in a predictable manner; the smaller the type, the shorter the reading distance between student and machine. Generally, this behavior is now understood as an attempt by the student to reduce the visual impact of the screen presentation, with its inherent illumination characteristics, while constrained by his visual acuity and the type size of the information displayed.

Location of the Viewer on the Work Surface. The question of viewer location was explored in order to characterize user preference. The students were asked if they moved the viewer from its original position (from one side of the work surface to the other) when they prepared to use the system. Over half of the students indicated that they did, indeed, shift the viewer to a more convenient position. The distribution of these preferences is shown in Figure 7. The location of the viewer, opposite to handedness, was the most common preference, but it is clearly related to the note-taking requirement associated with use of the system itself (as can be seen in the simulations).

Lighting Preferences. The preferences for lighting conditions in the reading room fall into two general categories as shown in Figure 8. The measurements were taken at the plane of the work surface. These data indicate that the student either desired high contrast between the viewer and its surround, or minimum contrast between the viewer and its surround. With the carrel light on, the vertical wall at the rear of the carrel is well illuminated and its reflection toward the user is highly diffuse. This condition would appear to be the most desirable because

* The practicality of the specific recommendation is not necessarily important; the perceived difficulty in maintaining spacial orientation and alignment is the essential lesson.

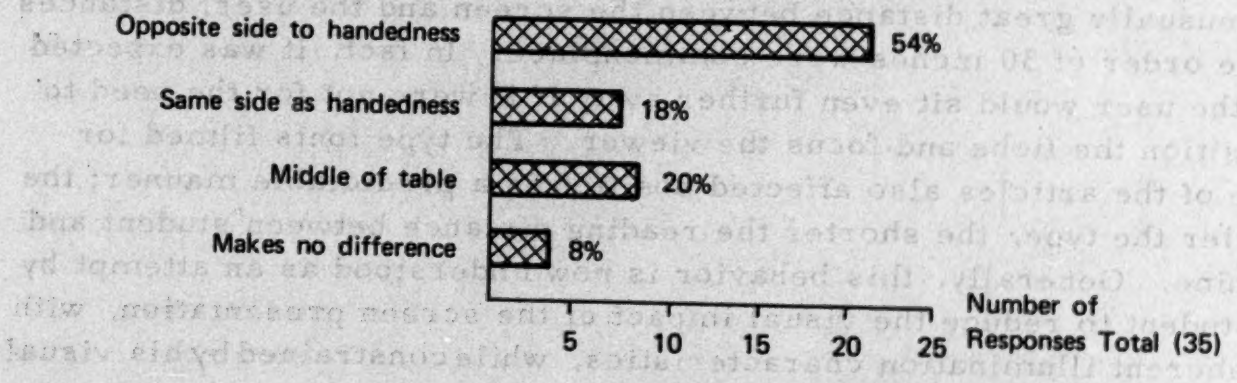

Figure 7. Preferences for Location of Viewer on Work Surface

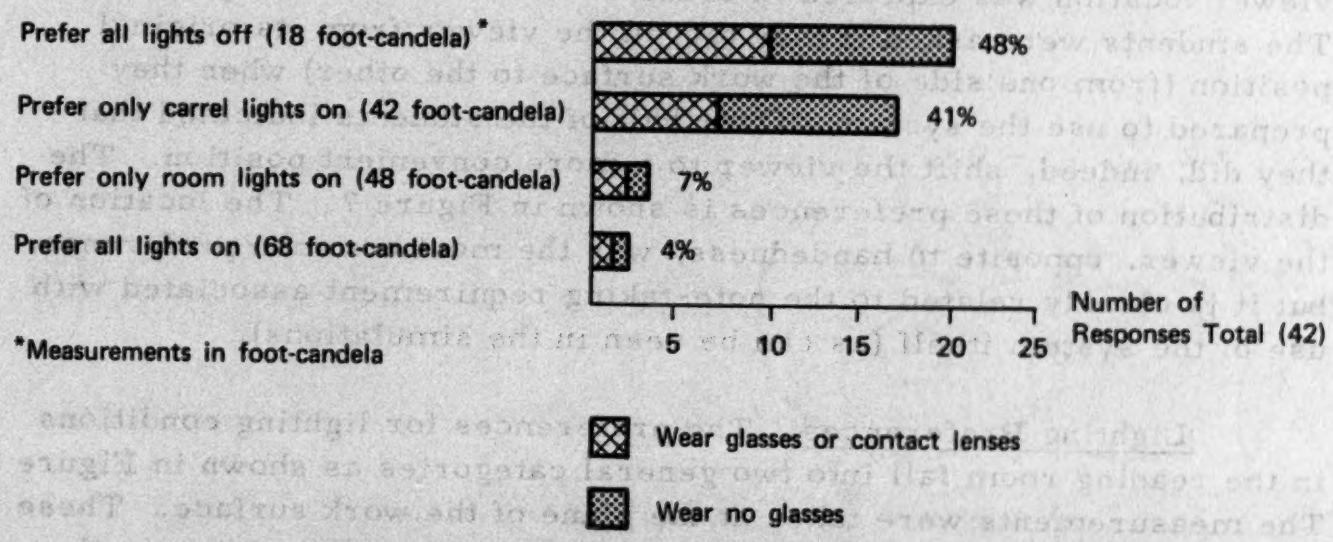

Figure 8. Preferences in Ambient Lighting

of the approximate illumination balance achieved between the viewer and background as seen from the user's position. This situation does, however, reduce the apparent contrast of the presentation itself, a factor that is responsible for the opposite preference of minimum ambient illumination indicated in Figure 8.

Figure 8 also shows that the basis of illumination preference is essentially independent of the use of glasses or contact lenses, a result consistent with the contrast interpretation understood as the basis of preference.

Subjective Fatigue. A primary concern expressed by the students, as indicated in Figure 9, was that of fatigue; 90% said that they suffered physical fatigue or eye fatigue, or both physical and eye fatigue. In addition, 60% of the class felt that it was necessary to take more breaks during microform use. These subjective feelings of fatigue are difficult to evaluate since they are not as easily quantified as objective measures of fatigue (e.g., grades, reading rate, comprehension). The observation that no objective indications of fatigue were found (i.e., no decrement in performance as evidenced by grades or reading rate) suggests that subjective feelings of fatigue stem from the students' responding to machine constraints.

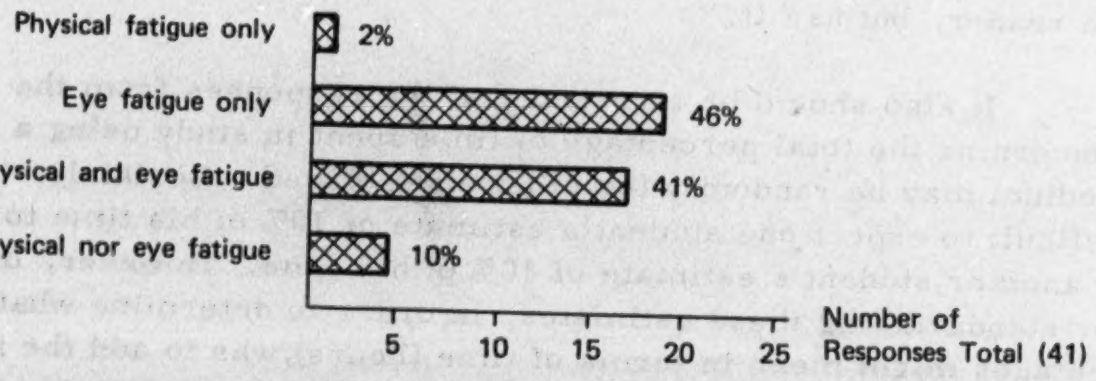

Figure 9. Distribution of Fatigue Responses

Subjective Evaluation of the Microform Experience

The subjective considerations of this experiment are narrowly summarized in this section. Appendix D presents complete student responses to eight questions that are only high-lighted here. This

approach has been chosen in order to preserve the main detail of the student experience; the specific responses presented in the Appendix are organized according to the extent of individual use of the microform system. Further, each statement made by a student is coded in a consistent manner, i.e., responses designated R&D 19, 20% refers to one student in the Readings and Discussion section of the class who estimated his use of the microform system comprised 20% of his total study effort. In this way, the individual respondent can be traced throughout the appendix, yet his response can be compared with others, having different total experience with the microform, on a per-question basis.

The Nature of Responses from Students, and Estimates of Time Spent on Each System. The responses and summaries developed here are taken directly from the data as given by the students.* It is important to note that the answers given by a student can only be taken as an indication of reality, since the relative nature of such questionnaires makes possible (and probable) some random error in specific responses. For example, student PP 13, in answering the questionnaire, stated that he used the Reader-Fiche system for 35% of his time spent studying, and then he proceeded to check "I feel indifferently toward the reader, but don't use it"; whereas, another student (PP 11) stated he used the Reader-Fiche system for only 10% of his time spent studying for the course, but checked the catagory "I feel indifferently toward the reader, but use it."

It also should be stressed that the responses from the students concerning the total percentage of time spent in study using a particular medium may be randomly (or otherwise) biased. Certainly, it would be difficult to expect one student's estimate of 10% of his time to be equal to another student's estimate of 10% of his time. However, one procedure for standardizing these estimates, in order to determine what the percentages might mean in terms of time (hours), was to add the individual estimates of percentages for a particular medium and divide this total into the total amount of time accounted for by the medium. This estimate of the total amount of time spent by a student on the microform system is useful in weighing the student's answers and in judging the conclusions

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* The post-class questionnaire was given during the final examination period. Data from the questionnaire is based upon 94% participation of the total class, since 3 students out of 53 were absent from the final examination. See Appendix C for the questionnaire instrument.

and implications of this study. The procedure resulted in an estimate of 26 hours for 100% use of the microform medium, a value substantiated by informal records kept by two students. However, since 333 hours of machine use and 355 hours of Reserve Room use were actually recorded, it appears that the student estimates are on the conservative side. This is not unexpected since the greatest proportion of machine use occurred during the first half of the 10-week period, five weeks before the estimates were solicited.

Use Problems. Comments on the failings of the microform system were both varied and insightful. For example, in response to the question "What did you like or dislike most about the Reader-Fiche system?" the following comments show the range of the users' problems. (See Appendix D, Question 1.)

> "The projected image was too small to lean back, too big to sit up close. Never focused well. Contained colors and dust in picture. Vertical orientation was awkward position to try and read in." (R&D9, 5%)
>
> "Too much time wasted looking up and down; lost place on reader." (R&D23, 35%)
>
> "I dislike not being able to underline and I got dizzy when I changed the pages." (R&D27, 60%)
>
> "The fact that the reading screen was perpendicular to the table rather than at an angle. This created an uncomfortable reading and head angle." (R&D34, 90%)
>
> "I liked the variety of material which the system can provide, but disliked greatly the focusing of the reader--requiring refocusing after each movement." (PP7, once)
>
> "The inability to look at graphs or pictures while reading an explanation of them." (PP15, 70%)

The importance of machine characteristics, especially its spacial orientation, is clear. Equipment design, in which the user's task is analyzed for the relationships between the work surface and the machine, and between the information presented and the way it is utilized, is clearly a starting point.

Alteration in Study Methods. Seventy-one (71%) percent of the students in the Reading and Discussion section said that the Reader-Fiche system altered their study methods (primarily by forcing them to take notes) while 69% of the Pre-Professional section said that the Microform system did not alter their study methods in any way. It seems appropriate to suggest that this is a basic difference in the study approach used by the students, and it is reflected in their choice of class section. The Reading and Discussion students seldom take notes and normally underline, while students in the Pre-Professional section (who intend to go on to graduate school) normally do take notes and, therefore, were less inconvenienced by the microform system.

The following are representative statements from the students concerning a change in study habits. (See Appendix D, Questions 2 and 3.)

> "Yes, forced me to take notes, rather than underline." (R&D 12, 10%)

> "Yes, note-taking instead of underlining; made it easier to study for tests even though it was a pain to take notes." (R&D 26, 60%)

> "Yes, it made me outline more and that's what I needed." (R&D 28, 70%)

The impact on study methods is clear, but other, more subtle, factors were identified through the question "Did note-taking present a problem?" Approximately two-thirds of the students felt that note-taking was a problem, and these difficulties are summarized in the following comments:

> "Yes, it is hard to read and keep the train of thought and take notes at the same time." (R&D 7, once)

> "No, note-taking as far as I can see would be one advantage to it; as you write it you learn it." (R&D 13, 10%)

> "Yes, I like to underline and put notes in the margins." (R&D 18, 20%)

> "Yes, very often I tended to write unimportant things down because not being able to see the whole article at once was a disadvantage." (R&D 31, 80%)

"Yes, lose your place easily while reading and taking notes." (PP 6, once).

Attitudes. It is interesting to note that the proportion of users to non-users is reversed for the two sections of the class. There are indications from the user/non-user "profiles" that the Pre-Professional section of non-users was unique, or at least atypical from average students and users, in two respects: (1) three of these non-users xeroxed the entire course material for their own use at home, and (2) all of the students who used the microform system once to 10% of their time spent studying also wore contact lenses or glasses.

In addition, student motivation, again, appeared to be a relevant dimension, especially under circumstances in which students were given equal availability of hardcopy and fiche. Under a moderate amount of motivation, a student seems to be willing to explore new methods for presenting information; but students who appear to be "task-oriented" or highly academically motivated (such as those enrolled in the Pre-Professional section) seem to prefer to stay with the better-known or more predictable method for obtaining their information. (See Table V below.)

Table V. Statements by Students Concerning Attitudes Toward the Viewer

	Used*	Did Not Use**
Readings and Discussion Section	62%	38%
Pre-Professional Section	38%	62%

* Used combines the categories:
I hate the reader, but use it anyway.
I feel indifferently toward the reader, but use it.
I like the reader and use it.

** Did not Use combines the categories:
I hate the reader and don't use it.
I feel indifferently toward the reader, but don't use it.
I never tried the reader.

One of the observations which is most difficult to interpret is that 35% of the Reading and Discussion students and 19% of the Pre-Professional students checked the category "I hate the reader, but use it anyway". The fact that 30% of the entire class disliked the reader and yet used it for a substantial portion of their time spent studying is important. Presumably, these students did not like the reader in terms of its constraining physical properties, but tolerated such inconveniences because of the system's functional properties, which facilitated efficient use of the materials. In fact, considering the limitations of the system (machine problems and the work station configuration) and the students' unfamiliarity with the mode of presentation, the overall use pattern is considered to be a positive statement on the utility of the microform concept.

Approximately two-thirds of the students said that their attitude toward the Viewer-Fiche system did <u>not</u> change after they had used it for awhile. In general, the students in this study either disliked the viewer at first and continued to dislike it or they liked it at first and continued to like it. The finding of such stable attitudes implies that initial impressions are <u>most</u> important, which, in turn, comments powerfully on the need for demonstration, instruction, and personal attention in order to implement any microform system. The following statements are representative of the comments the students made concerning this question. (See Appendix D, Question 4.)

> "No, I didn't like it at the beginning and I grew to dislike it more."
>
> "No, I hated it even from the beginning."
>
> "No, I enjoyed it from the start."

<u>Expanding Microform Use</u>. One-half of each section said that they would like to see continued or expanded use of this type of presentation for classroom purposes. Those who were pro praised the material's organization and accessibility; those who were against this type of presentation noted the technical difficulties of the machine (e.g., focus and screen angle were most often cited). These responses are compelling because they support the contention that an adequate microform system is primarily a design and availability problem. (See Appendix D, Question 5 and 6.)

> "No, I find it much easier to have my own books to read when and where I wish, even though it's more expensive." (R&D6, once)

"No, not until it's improved mechanically." (R&D 19, 20%)

"Yes, should start at earlier age in educational system." (R&D 32, 80%)

"Yes--having alternative sources--Fiche and Reserve Room, is good. Think the Fiche is much more efficient for assembling a varied collection of material." (PP 1, none)

"No, you can't take the machine outside with you to study." (PP 15, 70%)

The answers given to the question "How do you feel about obtaining your material from a machine? That is, are there qualities about the mechanical aspects of the transaction which are especially appealing or unappealing to you?" were disappointing. Either the question itself was not worded carefully enough to elicit pertinent responses or the students were so inured to mechanical presentations (TV, radio, telephone, etc.) that they couldn't identify a problem. Whatever the reason, only a few students reacted to the essence of the question, and these students tended to be those who least used the system.

"Too uncomfortable and somehow I like physical contact with material." (R&D 4, once)

"You can't take it home with you, doodle on it or even feel personally attached to it. Supposing everyone was very on to the machine, how would you apportion your time around the hours of a machine?" (R&D 13, 10%)

"Obtaining material from a machine is very impersonal. A book is something that belongs to you and is there all the time." (R&D 16, 10%)

"I felt somehow pressured to go quickly." (R&D 17, 15%)

"Fear of novel and fear of eye fatigue." (PP 2, none)

"Unappealing because it's a machine and one can't ask questions." (PP 12, 20%)

Student Recommendations. Probably the most interesting result of the probe for student recommendations to improve the system was the tendency of the students that used the system the least to offer specific suggestions while the students that used it the most had few suggestions, and these few tended to be vague. (See Appendix D, Question 7.) A match between problems recognized (Question 1) and recommendations was very infrequent. This tendency is not surprising because the experienced user senses the complexity of the problems and the interrelationships among them. The following responses are illustrative of specific suggestions:

"Need an underliner on the machine." (R&D 5, once)

"I don't know if it's possible but I'd like it better if it was flat on the table." (R&D 8, 5%)

"Make so that you can look down on it as you do a book and find a way to keep it in focus." (R&D 11, 10%)

"Start using these teaching methods earlier if they must be used." (R&D 15, 10%)

"Slant it back a little. Better focus mechanism." (R&D 19, 20%)

"Get different machines; or better still, provide every student with a machine." (PP 5, once)

"Make it into something like a pencil pad that you can keep on the table like a notebook." (PP 8, once)

Conclusions

The description of user behavior preferences and subjective evaluations, summarized in this Results section, suggest that there is no best approach to the design of a "use" environment. Just the opposite is indicated. The user should be given as much flexibility as possible when microform use on a routine basis is contemplated. The "casual" approach to using the equipment, as illustrated here, is a clue to the essential difference between routine and exceptional use of microform. Exceptional use of library microform is normally accompanied by urgent information needs. These needs create strong motivation for the user, and, to a large extent, any defects in the microform system

can be overlooked until the information need is satisfied. Routine use, however, is not usually accompanied by urgent information needs and, therefore, the motivation sustaining routine use is quite different and, perhaps, more fragile. System defects cannot be so easily overlooked because they are encountered repeatedly; hence, there is a need for flexibility in the "study" environment that is not required in the "reference" environment which characterizes the present library use mode relating to exceptional rather than routine uses (Kottenstette, 1971).

This work has led to several important design conclusions for institutional equipment as opposed to the personal or portable reader-viewers. The total experience suggests that the film reader and the work environment be integrated, perhaps to the extent that the viewer is literally part of the work station itself. The user should have control of the ambient and the internal illumination systems, the former possibly being controlled through a "carrel" approach to the problem. The spacial relationship between the screen and secondary materials (i.e., note pad or other hardcopy sources) is critical as are the maintenance of image focus and ease of film positioning. The development of a design concept for an institutional viewer system must be guided more by "what not to do" than by a proven set of design requirements; it should be clear, however, that the utilization of microform in an educational environment is limited by the conceptualization of user needs--in terms of both relevant information and hardware.

SUMMARY OF SPECIFIC RESULTS

Perhaps the most important discovery from this study is the fact that routine use of the fiche system is quite feasible and that failures are usually specific to the present limitations in environment and equipment.

An important aspect of this study was the use of vertical formatting. This method of arranging material on the fiche proved to be quite successful and the students had no difficulty in accessing the information or in orienting to the fiche layout.

Seventy-one percent (71%) of the students said that after they had used the Reader-Fiche system for awhile, their attitude toward it did not change. Students in this study either disliked the reader at first encounter and continued to dislike it, or they liked it at first and continued to like it. This implies that initial impressions are most important, which, in turn, has implications as to how manufacturers and librarians present the product; i.e., potential users need much personal instruction to generate positive attitudes.

Students generally like the reader to be located on the opposite side of the table to their handedness (i.e., on left side for a right-handed person).

Preferences for lighting were entirely different from that anticipated: 48% preferred all lights off; 41% preferred only carrel lights on; 7% preferred only room lights on; and 4% preferred all lights on. These results indicate that microform rooms need variable lighting conditions to accommodate preferences and that further careful study needs to be made for precise ambient lighting control.

A primary concern expressed by the students was fatigue; 90% said that they suffered physical fatigue or eye fatigue, or both physical and eye fatigue.

Seventy-one percent (71%) of the students in the Reading and Discussion section of the class said that the Reader-Fiche system altered their study methods (primarily by forcing them to take notes) while 69% of the Pre-Professional section (who intended to go on to graduate school) normally take notes and therefore were not inconvenienced by the Reader-Fiche system.

There were no significant differences in grades between the students who used the Reserve Room for 67% or more of the articles assigned and those who used the Reserve Room for 40% or fewer of the articles assigned. This latter group includes those who used the readers and those who, perhaps, did not use either the readers or the Reserve Room extensively.

Precisely 50% of each section (and of the total class) said that they would like to see continued or expanded use of this type of presentation for classroom purposes. Those who were pro praised the material's organization and accessibility; those who were against this type of presentation noted the technical limitations of the machine (e.g., focus and screen angle were most often cited).

Of those students who said that they used the Reader-Fiche system once to 10% of the time spent studying, 81% wore contact lenses or glasses to read; whereas, of those using the reader 15% to 90% of their time spent studying, only 26% wore contacts or glasses to read.

REFERENCES

1. Kottenstette, James P., An Investigation of the Characteristics of Ultrafiche and its Application to Colleges and Universities, DRI, Denver, Colorado, August 1969. (Denver Research Institute for the U.S. Office of Education, Bureau of Research, Contract OEC-0-8-080826-4648(095)).

2. Cofer, C. N. and Appley, M. H., Motivation: Theory and Research, John Wiley and Sons, Inc., New York, 1964.

3. Kottenstette, James P., "Testing Student Reactions to Educational Microform: Many Problems--A Few Answers." J. of Micrographics, January 1971.

APPENDIX A

Syllabus for 36-213, Sensation and Perception

Syllabus for 36-213, SENSATION AND PERCEPTION

Spring, 1970

Z. J. Ulehla, instructor
Leo Delphini, teaching assistant

The sensation and perception course will be conducted in a new way, which is frankly experimental. In the past, the same set of activities was provided for all students, regardless of their interests and their reasons for taking the course. One of the important differences among the students involves the bearing of this course upon their professional aspirations. Some students, usually a small minority, plan a professional career in psychology or in a related behavior science, and look forward to a much more intensive educational experience at the graduate level. For these students, an introduction to the theories, methods and research of contemporary perceptual psychology is important in order that they may learn the vocabulary and concepts that will be expected of them by their instructors and colleagues in graduate school. The highly abstract, usually mathematical formulations that dominate contemporary theory in sensation and perception are an important part of the conceptual repertoire available to the contemporary psychologist, and thus constitute important material for the aspiring behavior scientist. Although it is important for the student to be able to understand some of the jargon and perspectives of the discipline, he is not expected to become fluent and effective with this material until he has completed more advanced training.

The majority of psychology majors, however, have no plans for advanced work in psychology, but seek a liberal education. Some of the abstract formulations, which are of particular importance to the aspiring psychologist in order that he may be prepared for more advanced work, will never be "relevant" for the remainder of the students because their applicability to real problems depends upon training beyond the B. A. degree.

Ideally, the different needs of the two types of student should be reflected in different course requirements. Although some psychology faculty (including the instructor of this course) favor such a development, it must be considered in the context of the total undergraduate program and curriculum change has proven to be slow and difficult. Thus, 36-213 remains a required course for all psychology majors.

The next best course of action is to build some flexibility into the 36-213 course itself. This is part of the experiment. Recommended for most students who have no career aspirations in the behavhior sciences is a program of readings in and discussion of topics of general interest. Little or no mathematical theory and methods will be included. Recommended for the students who plan advanced work in behavior science will be a more abstract and mathematical set of readings, with associated lecture and discussion. Furthermore, these students will be expected to complete a research requirement.

Details of these alternative programs are presented below.

PRE-PROFESSIONAL PROGRAM

The program recommended for students who expect to go on to graduate work in a behavior science includes readings, lecture and discussion sections, and laboratory work. The readings will emphasize contemporary theory and associated research, most of which employs mathematical models and quantitativ methods. The lecture and discussion sections will attempt to aid the student in understanding the readings and to interrelate and further develop the theories and models. The laboratory work will involve application of the concepts presented in the readings and lectures to either visual perception or social perception (student's choice).

The lecture and discussion meetings will take place in GCB 314 at 3:00 p.m. on Thursday and Friday of each week. The laboratory work will be scheduled ad hoc as necessary for completion of the project. Students will also be given a midterm and final exam (essay type).

Students selecting this program are invited to attend the Monday and Wednesday discussion sessions presented as part of the General Reading and Discussion Program, but attendance is not mandatory.

Readings:

Dember: Chapters 2,4
Corso: Chapters 7,11
Swets, Tanner, and Birdsall
Egan and Clark
Bruner
Price
Clark
Grice
Hochberg: Effects of the Gestalt Revolution
Hochberg: Perception - Chapters 5,6
Helson
Dember: Chapters 8,9
Stevens
Miller
Hake and Rodwan
von Bekesy
Loewenstein
Gregory (entire book)

GENERAL READING AND DISCUSSION PROGRAM

This program will consist of reading the assigned material and attending discussion sections on that material with the instructor and/or the teaching assistant. Class times for the discussions will be Monday and Wednesday of each week at 3:00 p.m. in GCB 314. In addition to a midterm and final of a comprehensive nature, there will be six short quizzes on the readings, each covering a section (Section 1 material will be covered with Section 2 material.)

These quizzes serve four functions:

1. Primarily, they will give you week-by-week feedback on how you are assimilating the content material. It is hoped that this approach will help keep the material from snowballing and will help you to structure and pace yourself on how much you need to accomplish each week.

2. It is further hoped that by having weekly quizzes the Reader-fiche system and the Reserve Room will be used over more time than would be true under circumstances in which only a midterm and final exam were anticipated.

3. In addition, weekly quizzes will give your instructor more detailed information about which portions of the course are the most troublesome for students.

4. Of course, the quizzes will indicate the extent to which you have read and understood the material, and will thus provide a major basis for your course grade.

The lowest grade of the six quizzes will be dropped (this low grade may be a missed quiz.) However, NO make up quizzes will be given! The five quizzes retained will provide 50% of the course grade; the midterm and the final will each count 25%.

Students electing this program are invited to attend the lectures on Contemporary Theory which will be given every Thursday and Friday at 3:00 p.m. in GCB 314. However, attendance is not mandatory and students of the General Reading and Discussion Program will not be examined on this material. Laboratory work will not be required for this program, but will be available for those students who desire it.

READING ASSIGNMENTS FOR THE GENERAL READING AND DISCUSSION PROGRAM

Topic 1. What is perception?

Bember: Chapter 1
Gregory: Chapter 1

Topic 2. The anatomic and physiological basis of perception: Sense organs and their structure.

Gregory: Chapters 2,3,4
von Bekesy: The Ear (also relevant to Topic 3)
von Bekesy: Taste Theories
Mueller: Chapters 5,6,7,8

QUIZ: April 13

Topic 3. The anatomic and physiological basis of perception: Neural processes of sensory information.

Gregory: Chapter 5
Loewenstein
Pfaffman
Lettvin, et al.
Hernandez-Peon

QUIZ: April 20

Topic 4. Perceptual organization: How do we make sense out of incoming stimulation?

Gregory: Chapters 6,7,8,9,10,12,13
Hochberg: Perception - Chapters 5,6
Hochberg: Effects of the Gestalt Revolution

QUIZ: April 27

MID-TERM: May 4, 1970

Topic 5. Effects of set, expectation and need: Do we see what we expect or wish to see?

Bruner
Dember: Chapters 8,9
Melzach

QUIZ: May 11

Topic 6. Perceptual development: Do we have to learn to see?

Gregory: Chapter 11
Riesen
Walk, Gibson, and Tighe
Fantz

QUIZ: May 18

Topic 7. Curiosity, exploration, deprivation: Is perception an end in itself?

Dember: Chapter 10
Bexton, Heron, and Scott
Heron, Doane, and Scott

QUIZ: May 25

FINAL EXAM: Friday, June 5, 1970 - 2 pm

APPENDIX B
Index to Reading Materials

SENSORY-PHYSIOLOGICAL

	Book Page	Microfiche Row/Column
von Békésy: The Ear (In King)	273	2/48
(In Coopersmith: Frontiers of Psychological Research. Freeman & Co., 1964).	44	2/49
von Békésy: Taste Theories and the Chemical Stimulation of Single Papillae (In Gross & Zeigler: Readings in Physiological Psychology: Neurophysiological/Sensory Processes. Harper & Row, 1969).	128	2/44
Hernández-Peón, Scherrer, & Jouvet: Modification of Electrical Activity in Cochlear Nucleus During "Attention" in Unanesthetized Cats (In Gross & Zeigler).	270	2/46
(In King: Readings for an Introduction to Psychology. McGraw-Hill, 1966).	294	2/47
Lettvin, Maturana, McCulloch, & Pitts: What the Frog's Eye Tells the Frog's Brain (In Gross & Zeigler).	199	2/45
Loewenstein: The Generation of Electric Activity in a Nerve Ending (In Gross & Zeigler)	57	2/52
Melzach: The Perception of Pain (In Coopersmith)	193	2/53
Mueller: Sensory Psychology. Prentice-Hall, 1965.		
5. Taste	67	2/42
6. Smell	77	12/42
7. Touch and Temperature Sensitivity	87	22/42
8. Vestibular & Kinesthetic Senses	103	2/43
Pfaffmann: The Afferent Code for Sensory Quality (In Gross & Zeigler)	118	2/50
(In King)	285	2/51

CLASSICAL CONCERNS

	Book Page	Microfiche Row/Column
Bexton, Heron, & Scott: Effects of Decreased Variation in the Sensory Environment (In Beardslee & Wertheimer: Readings in Perception. Van Nostrand, 1958)	322	2/26
Bruner: On Perceptual Readiness (In Beardslee & Wertheimer)	686	2/24
Corso: Experimental Psychology of Sensory Behavior. Holt, Rinehart, Winston, 1967.		
14. Sensory Deprivation	550	2/21
Dember: Psychology of Perception. Holt, Rinehart, Winston, 1967.		
Contents	ix	6/2
1. Introduction	1	9/2
2. Threshold Measurement Techniques	27	2/3
4. Visual Psychophysics	110	2/7
7. Effects of Learning on Perception	235	2/11
8. Set and Perception	271	2/12
9. Motivational Effects on Perception	306	2/13
10. Stimulus Complexity, Motivation, and Emotion	341	2/14
References	376	2/15
Index of Authors	393	18/15
Index of Subjects	397	22/15
Fantz: The Origin of Form Perception (In Coopersmith: Frontiers of Psychological Research. Freeman and Company, 1964).	36	2/28
Heron, Doane, & Scott: Visual Disturbances after Perceptual Isolation. (In Beardslee & Wertheimer).	328	2/27
Hochberg: Effects of the Gestalt Revolution. (In Beardslee & Wertheimer).	525	2/23
Hochberg: Perception. Prentice-Hall, Inc., 1964.		
5. Higher-order variables in perception	73	2/19
6. Social perception and communication	100	2/20
Index	117	19/20
Riesen: Arrested Vision (In Coopersmith)	170	2/29
Walk, Gibson, & Tighe: Behavior of Light-and Dark-Reared Rats on a Visual Cliff (In King: Readings for an Introduction to Psychology. McGraw-Hill, 1966).	297	2/30

CONTEMPORARY THEORY

	Book Page	Microfiche Row/Column
Clark: The PSYCHE in Psychophysics: A Sensory-Decision Theory Analysis of the Effect of Instructions on Flicker Sensitivity and Response Bias. Psychological Bulletin, 1966, 65, (6), 358-366.		2/78
Corso: Experimental Psychology of Sensory Behavior. Holt, Rinehart, & Winston, 1967.		
7. Psychophysical Methods	219	2/63
11. Theories of Sensory Discrimination	409	2/65
12. Information Theory	461	2/67
Egan & Clarke: Psychophysics & Signal Detection (In Sidowski: Experimental Methods and Instrumentation in Psychology. McGraw-Hill, 1966).	211	2/69
Grice: Stimulus Intensity & Response Evocation. Psychological Review, 1968, 75, (5), 359-373.		2/74
Hake & Rodwan: Perception and Recognition (In Sidowski)	331	2/70
Helson: Adaptation Level Theory (In Beardslee & Wertheimer: Readings in Perception. Van Nostrand, 1958).	335	2/73
Miller: Information Theory (In Beardslee & Wertheimer).	90	2/72
Price: Signal-Detection Methods in Personality and Perception. Psychological Bulletin, 1966, 66, (1), 55-62.		2/75
Stevens: The Surprising Simplicity of Sensory Metrics. American Psychologist, 1962, 17, (1), 29-39.		2/79
Swets, Tanner, & Birdsall: Decision Processes in Perception. Psychological Review, 1961, 68, (5), 301-340.		2/76

APPENDIX C
Forms Used in the Experimentation

FORM FOR READER-FICHE SYSTEM

Each of the Readers has a timing device so that we can obtain over-all use patterns each day. In order to have more detailed records of use, PLEASE fill out this form at each and every use. It asks only for how long you used the machine (e.g., 3:20-4:15) and for the Author of the material you read. Thank you.

This information is for research purposes only and will NOT be used in any manner to determine course grades!

DO NOT SIGN THESE STATEMENTS!

I USED THE READER FROM_____ TO_____

AUTHOR OF MATERIAL READ_____

Please feel free to make any suggestions or comments concerning ANY aspect of this experiment. If you feel you don't have adequate access to the Readers or you can't stand the Readers--SAY SO!

FORM FOR RESERVE ROOM

Please fill out this form at each and every use:

Time checked out_____

Time returned_____

Did you make Xerox copies? YES_____ **NO**_____

If yes:

Of the whole article? YES_____ **NO**_____

Of specific pages only?_____

Author_____

Today's date_____

This information is for research purposes only and will not be received by your instructor nor in any way influence your course grade.

DO NOT SIGN THIS STATEMENT!

Return to Librarian

POST-CLASS QUESTIONNAIRE

I wear glasses to read_____ I am right handed_____
I wear contact lenses to read_____ I am left handed_____
Neither_____

1. Did you fill out a form each time you used the material in the RESERVE ROOM?

_____All the time
_____Some of the time
_____Seldom
_____Never

2. Did you fill out a form each time you used the READER-FICHE system?

_____All the time
_____Some of the time
_____Seldom
_____Never

3. Please check one of the following:

_____I lost my fiche and therefore never use the reader
_____I hate the reader and don't use it
_____I hate the reader, but use it anyway
_____I feel indifferently toward the reader, but don't use it
_____I feel indifferently toward the reader, but use it
_____I like the reader and use it

4. Of the total percentage of time spent reading for this course, how much was spent on each of the following:

_____% Gregory
_____% Reserve Room
_____% Fiche used in Library
_____% Fiche used in Psychology Laboratory
_____% Other sources--What sources?_____

5. Have you used sources other than the fiche or the Reserve Room for obtaining the reading information for the course?

YES_____ NO_____

If yes, what other sources: D. U. Library (not Reserve Room)_____
Other libraries_____
Books from Friends_____
Notes from Friends_____
Books you bought_____

6. Have you bought any material for this course, other than Gregory?

YES_____NO_____

If yes, what authors_____

7. Were the readers already being used the first few times you went to use them?

YES_____NO_____

8. Until the Woodstock-Kent State crisis (which corresponded to the mid-term for this class), the use of the Reader-Fiche system and the Reserve Room was high. Since that time use has deteriorated. Can you give any insights into why?

9. Where on the table would you prefer the reader to be located?

LEFT_____ RIGHT_____ MIDDLE_____

10. Where on the table was the reader normally located when you used it?

LEFT_____ RIGHT_____ MIDDLE_____

11. Please check one:

When using the reader I prefer all lights off_____
When using the reader I prefer only carrel lights on_____
When using the reader I prefer only room lights on_____
When using the reader I prefer all lights on_____

12. What did you like or dislike most about the Reader-Fiche system?

13. Did the Reader-Fiche system alter your study methods in any way?

YES_____ NO_____ Please explain:

14. Do the physical characteristics of the reader provide restraints which lead to discomfort or fatigue?

Physical fatigue_____ Eye fatigue_____
Both_____ Neither_____

15. After you had used the reader-fiche system for awhile, did your attitude toward it change?

YES_____ NO_____ Please explain:

16. Did you ever read material which was beyond your assignment?

YES_____ NO_____

17. Did you prefer a particular reader?

YES_____ NO_____ Please explain:

18. Would you like to see continued or expanded use of this type of presentation for classroom purposes?

YES_____ NO_____ Please explain:

19. Did the complete information availability adequately compensate for any deficiencies in the system?

YES_____ NO_____ Please explain:

20. Could you study just as long at one sitting with the Reader-Fiche system or was it necessary to take more breaks?

Yes, just as long_____ No, more breaks_____

21. Did note-taking present a problem?

YES_____ NO_____ Please explain:

22. Were you satisfied with the organization of the material on the fiche?

YES_____ NO_____ Please explain:

23. How do you feel about obtaining your material from a machine? That is, are there qualities about the mechanical aspects of the transaction which are expecially appealing or unappealing to you?

24. Do you have any recommendations for the improvement of the Reader-Fiche system?

APPENDIX D

Statement by the Students from the Questionnaire

STATEMENTS BY THE STUDENTS FROM THE QUESTIONNAIRE

INDEX TO QUESTIONS

1. What did you like or dislike most about the Microform System?

2. Did the Microform System alter your study methods in any way?

3. Did note-taking present a problem?

4. After you had used the Reader-Fiche system for awhile, did your attitude toward it change?

5. Would you like to see continued or expanded use of this type of presentation for classroom purposes?

6. How do you feel about obtaining your material from a machine? That is, are there qualities about the mechanical aspects of the transaction which are especially appealing or unappealing to you?

7. Do you have any recommendations for the improvement of the Reader-Fiche system?

8. Until the Woodstock-Kent State crisis (which corresponded to the mid-term exam for this class), the use of the Reader-Fiche system and the Reserve Room was high. Since that time, use has deteriorated. Can you give any insights to why?

Question 1

What did you like or dislike most about the Viewer-Fiche System?

Viewer Use = None

RD1. Did not use.
RD2. Did not use.

PP1. Did not use.
PP2. Did not use.
PP3. I just did not have the time. I do ALL my studying from 9 p.m. to 5 a.m.
PP4. Restricted my ability to study when and where I prefer.

Viewer Use = Once

RD3. It was inconvenient to wait your turn to read at given times of day. It was confusing to locate articles. It was an unnecessary nuisance to write notes instead of underline.
RD4. Difficult to achieve proper focus. Rainbow colors distracting.
RD5. Disliked the way I had to go about getting material or machine to read.
RD6. It tired my eyes and was a mess having to read a paragraph or two and then look away to take notes and look back again to read.
RD7. It gave me a headache and my eyes got sore and tired and they stayed that way for several days.

PP5. It did not seem to stay in focus from one frame to the next. The colors were distracting. It demanded a certain schedule (not available after 12 p.m.) and for this course I read most of the material after 12 p.m.). I underline text material and write indexing notations in margins; it would be inefficient to take notes from the reader--for me. The idea is certainly commendable as far as cost is concerned and undoubtedly has other attributes as well.
PP6. Not in focus, hard to keep your place and it was just as easy or easier to get material in the Reserve Room.
PP7. I liked the variety of material the system can provide, but disliked greatly the focusing of the reader--requiring refocusing after each movement.

Viewer Use = Once (Cont.)

PP8. It was too far away--with a book one feels closer--the machine not only hurt my concentration but made it difficult.

PP9. Hard to take notes.

Viewer Use = 1-10%

RD8. It was very awkward to take notes while using the reader and I also got headaches using it.

RD9. The project image was too small to lean back, too big to sit up close. Never focused well. Contained colors and dust in the picture. Vertical orientation was awkward position to try and read in.

RD10. The poor quality of the fiche.

RD11. Kept getting out of focus, forced me into an uncomfortable reading position.

RD12. Can't underline for review.

RD13. Eye strain. Inconvenience, restrictions due to room, amount of people, time schedules limited its versatility. For those of us whose studying abilities flourish late at night, it seemed to limit.

RD14. My eyes always hurt when I used the machine. Also, I would prefer to have my materials at home, since I live fairly far from campus and getting over here was a pain.

RD15. Really made my eyes hurt for entire day!

RD16. The reader fiche system gave me a headache, even with my glasses on. It was also bummer to have to go to the library and not being able to study at home.

PP10. It was being used most of the time. One could not read for a long period because of my eyes hurting. It took longer to read the material. Had to use it when building was open.

PP11. Having to go to the Department secretary to get the keys for weekend.

Viewer Use = 11-20%

RD17. Uncomfortable to take notes with paper on my lap.

RD18. The poor quality of the pictures and the fact the machine was DIM.

Viewer Use = 11-20% (Cont.)

RD19. Disliked: it was hard to focus--too time consuming. Didn't like its upright position. Liked: it was a change from the "book-drag".

RD20. Hard to adjust to it, but I think it could become very useful if I had to use it all the time. I hate going to the library.

PP12. The trouble getting there.

Viewer Use = 21-30%

RD21. It gave me a headache.

Viewer Use = 31-40%

RD22. It was cheap. It was different. It was hard to get used to--in fact, I probably never did.

RD23. Too much time wasted looking up and down; lost place on reader.

RD24. Focus.

RD25. It gave me a headache.

PP13. My eyes got tired fast. When I read I prefer to look down and not straight ahead.

PP14. Can't highlight or write on.

Viewer Use = 41-50%

None

Viewer Use = 51-60%

RD26. Disliked: worrying about whether or not the reader would be in use when I needed it. Liked: quiet of reader room.

RD27. I disliked not being able to underline and I got dizzy when I changed the pages.

Reader Use = 61-70%

RD28. Looking from reader to paper--reading what I wrote easier than the reader and therefore having to adjust my eyes.

PP15. The inability to look at graphs or pictures while reading an explanation of them.

Viewer Use = 71-80%

RD29. The one machine wouldn't stay in focus and I would always strain my eyes.

RD30. It saved us money on those high-priced books--that was good and it made things easier.

RD31. If you read the articles only once it was hard to grasp everything in the article.

RD32. Took too long; but learned well.

RD33. On some articles, the print was too small to read. Sometimes it would give me a headache.

PP16. The color was sometimes distracting (greenish). Everytime the plate was moved to the next page it had to be focused.

Viewer Use = 81-90%

RD34. The fact that the reading screen was perpendicular to the table rather than at an angle. This created an uncomfortable reading and head angle.

Viewer Use = 91-100%

None

Question 2

Did the Viewer-Fiche System alter your study methods in any way?

Viewer Use = None

RD1. --
RD2. --

PP1. --
PP2. --
PP3. --
PP4. --

Viewer Use = Once

RD3. Yes, I underline my books and study at night (after 12 p.m.).
RD4. No.
RD5. Yes, I had to come to library.
RD6. Yes, much more time was spent at the library studying instead of in my room.
RD7. Yes, I've studied very poorly because I don't have the information and I have to take notes. Sometimes it's hard to get the information and I can't have it when I want it.

PP5. No.
PP6. No.
PP7. Yes, it would have if I'd used it more--i.e., preparation of material earlier than the night before the test. However, the Reserve Room had nearly the same effect.
PP8. No, ignored it after using it once.
PP9. No, only used it once.

Viewer Use = 1-10%

RD8. No.
RD9. No.
RD10. Yes, I had to drive to school to use it.
RD11. No.
RD12. Yes, forced me to take notes, rather than underline.
RD13. --
RD14. Yes, somewhat, since I had to take more detailed notes since the articles weren't readily available for review.

Viewer Use = 1-10% (Cont.)

RD15. --
RD16. Yes, I had to take notes on reading which was very arduous.

PP10. No, I just didn't get the reading done until I started using the Reserve Room.
PP11. No.

Viewer Use = 11-20%

RD17. Yes, slowed me down.
RD18. Yes, had to leave my comfortable bed in order to go to the reader.
RD19. No.
RD20. Yes, went to the library more.

PP12. Yes, had to adapt to new study place.

Viewer Use = 21-30%

RD21. Yes, I never go to the library--prefer to study at home. Also, not being able to have the book handy was very upsetting.

Viewer Use = 31-40%

RD22. No.
RD23. Yes, takes longer.
RD24. Yes, spent a half hour going to and from library.
RD25. Yes, I didn't study nearly as much and crammed when I did study. It would have been much more worthwhile for me to have bought the books--but I was broke.

PP13. Yes, I had to go to the Library or Psychology Laboratory to study.
PP14. Yes.

Viewer Use = 41-50%

None

Viewer Use = 51-60%

RD26. Yes, note-taking instead of underlining. Made it easier to study for tests even though it was a pain to take notes.

RD27. No.

Viewer Use = 61-70%

RD28. Yes, it made me outline more and that's what I needed.

PP15. No.

Viewer Use = 71-80%

RD29. Yes, I usually study at home during the evenings. For this course I studied in the mornings at the library and I hate the library. I also had to study longer than I would if I had the books.

RD30. Yes, made me get more into the library and stay there for a length of time.

RD31. No.

RD32. Yes, took notes.

RD33. Yes, I couldn't underline the books. More time wasted writing, accuracy and detail of notes was sacrificed.

PP16. No, I just set aside a couple hours each day to read. It happened to be earlier in the day than if I'd done the reading at home with my own texts.

Viewer Use = 81-90%

RD34. Yes, because I was required to study more from notes than underlining in a text.

Viewer Use = 91-100%

None

Question 3

Did note-taking present a problem?

Viewer Use = None

RD1. --
RD2. --

PP1. --
PP2. --
PP3. --
PP4. --

Viewer Use = Once

RD3. Yes.
RD4. No.
RD5. Yes.
RD6. No.
RD7. Yes, it is hard to read and keep the train of thought and take notes at the same time.

PP5. Yes, it would have taken too long; it would have been inefficient.
PP6. Yes, lose your place easily while reading and taking notes.
PP7. Yes, reader on wrong side of table. (Right-handed student who preferred reader on left side, but found it on right side.)
PP8. Yes.
PP9. Yes.

Viewer Use = 1-10%

RD8. Yes, kept losing my place in the material when I took notes.
RD9. No, this remained the same.
RD10. Yes, I prefer making notes in my texts.
RD11. No, except for uncomfortable posture.
RD12. Yes, time.
RD13. No, note taking as far as I can see would be one advantage to it; as you write it you learn it.
RD14. Yes.
RD15. No.
RD16. Yes.

Viewer Use = 1-10% (Cont.)

PP10. Yes, had to take very long and complete notes.
PP11. No.

Viewer Use = 11-20%

RD17. Yes, pad use on my lap caused discomfort.
RD18. Yes, I like to underline and put notes in the margins.
RD19. Yes.
RD20. Yes, lighting not very good.

PP12. No.

Viewer Use = 21-30%

RD21. Yes, it's very hard to know what to take notes on; it's better to have a book so you can mull over it.

Viewer Use = 31-40%

RD22. No.
RD23. Yes.
RD24. Yes, couldn't underline important points.
RD25. Yes, I didn't and should have.

PP13. No.
PP14. Yes.

Viewer Use = 41-50%

None

Viewer Use = 51-60%

RD26. No.
RD27. No.

Viewer Use = 61-70%

RD28. Yes.

PP15. Yes.

Viewer Use = 71-80%

RD29. Yes, I write very slowly and note taking is very time consuming.

RD30. Yes, I got tired of writing sometimes, but I'm a bad note taker anyway.

RD31. Yes, very often I tended to write unimportant things down because not being able to see the whole article at once was a disadvantage.

RD32. No.

RD33. Yes.

PP16. Yes, I could not underline or use a paper to keep my place while taking notes.

Viewer Use = 81-90%

RD34. No.

Viewer Use = 91-100%

None

Question 4

After you had used the Viewer-Fiche System for awhile, did your attitude toward it change?

Viewer Use = None

RD1. --
RD2. --

PP1. --
PP2. --
PP3. --
PP4. --

Viewer Use = Once

RD3. --
RD4. No, still disliked it.
RD5. No.
RD6. No, I only used it once.
RD7. No, I didn't like it at the beginning and I grew to dislike it more.

PP5. No, I did not have the time to adjust to it--not when copies of the material were also available.
PP6. No.
PP7. No.
PP8. No.
PP9. --

Viewer Use = 1-10%

RD8. No.
RD9. Yes, went from bad to worse.
RD10. No, I have used the system at the Ford dealer I work for.
RD11. No.
RD12. No.
RD13. Yes, I was seriously willing to see it as a learning advantage but just technical difficulties of it striked out its success.
RD14. No, never liked it very well.
RD15. No.

Viewer Use = 1-10% (Cont.)

RD16. No.

PP10. Yes, I disliked it more. At first it was kind of unique.
PP11. No.

Viewer Use = 11-20%

RD17. No, never felt comfortable with it.
RD18. No.
RD19. Yes, I disliked it more; too time-consuming to get it focused.
RD20. Yes, hated at first, better liked at end.

PP12. No, a good idea, and cheap for students, but I didn't like location.

Viewer Use = 21-30%

RD21. No.

Viewer Use = 31-40%

RD22. No.
RD23. Yes, started very pro and went to negative.
RD24. Yes, I began to dislike it more.
RD25. Yes, I began to hate it.

PP13. Yes, I began to dislike it intensely.
PP14. No.

Viewer Use = 41-50%

None

Viewer Use = 51-60%

RD26. Yes, I liked it at first, but later came to dread the hours I had to spend using it.
RD27. No.

Viewer Use = 61-70%

RD28. --

PP15. Yes, I liked the idea of having all the course material printed on one card, but then the problem arose as to where and when I would use it.

Viewer Use = 71-80%

RD29. No, I hated it even from the beginning.
RD30. No, I enjoyed it from the start.
RD31. No.
RD32. No.
RD33. No.

PP16. No.

Viewer Use = 81-90%

RD34. No.

Viewer Use = 91-100%

None

Would you like to see continued or expanded use of this type of presentation for classroom purposes?

Viewer Use = None

RD1. Yes, easy accessibility for large class--also lower book cost.

RD2. --

PP1. Yes--having alternative sources--fiche and Reserve Room is good. Think the fiche is much more efficient for assembling a varied collection of material.

PP2. Perhaps I really did not give it a chance.

PP3. Possible.

PP4. Indifferent.

Viewer Use = Once

RD3. No, it jeopardizes the students in that they must ascribe to another person's method of study.

RD4. No.

RD5. No.

RD6. No, I find it much easier to have my own books to read when and where I wish, even though it's more expensive

RD7. No, I said earlier that I don't like not having the information when I want it.

PP5. Perhaps I would be more favorably inclined if different machines were used.

PP6. Yes, if flaws of machine can be worked out.

PP7. Yes, if machine focus weren't such a problem.

PP8. No.

PP9. Not sure.

Viewer Use = 1-10%

RD8. No.

RD9. No, does much more harm than good.

RD10. Yes, if and when the technical quality of the fiche and the light intensity of the reader is improved.

Viewer Use = 1-10% (Cont.)

RD11. Yes, although keeping the option open for people who don't like it.

RD12. Yes, I like the ratio of storage density to weight.

RD13. No, I personally like the feeling that I can have the material I'm studying right at hand at any time. The very physical makeup of the reader prevents this.

RD14. No, except in a few cases when not all of the material is available in other forms.

RD15. No.

RD16. Yes, if there were more readers available.

PP10. No, too many people, not enough machines. I like to read very late at night.

PP11. Indifferent.

Viewer Use = 11-20%

RD17. No, tedious, fatiguing process.

RD18. I am neutral!

RD19. No, not until it's improved mechanically.

RD20. Yes.

PP12. Yes, good experience.

Viewer Use = 21-30%

RD21. No, it is very hard to do work on the reader; it is much better to be able to read at home.

Viewer Use = 31-40%

RD22. Yes.

RD23. Yes, if improved.

RD24. No, too much time going to and from library or laboratory.

RD25. Yes, I suppose it takes getting used to. Perhaps 1/3 of the material presented this way.

PP13. No.

PP14. No.

Viewer Use = 41-50%

None

Viewer Use = 51-60%

RD26. No, having to wait for the reader messes up one's study schedule.

RD27. Yes, it's a nice change--I get tired of looking at books.

Viewer Use = 61-70%

RD28. Yes, if some of the problems are worked out. Books, if available, are still better.

PP15. No, you can't take the machine outside with you to study.

Viewer Use = 71-80%

RD29. No.

RD30. Yes, this is a benefit to all students.

RD31. Yes.

RD32. Yes, should start at earlier age in educational system.

RD33. Yes, if some improvements such as mentioned above can be made.

PP16. No, with the limited number of machines it doesn't seem viable for a large class. Most people seemed to zerox the stuff anyway. Sets of keys limited for room use after hours.

Viewer Use = 81-90%

RD34. Yes.

Viewer Use = 91-100%

None

Question 6

How do you feel about obtaining your material from a machine--that is, are there qualities about the mechanical aspects of the transaction which are especially appealing or unappealing to you?

Viewer Use = None

RD1. --
RD2. I have never liked to read off a machine. I much prefer a book.

PP1. --
PP2. Fear of novel and fear of eye fatigue.
PP3. --
PP4. --

Viewer Use = Once

RD3. I cannot take this question seriously.
RD4. Too uncomfortable and somehow I like physical contact with material.
RD5. --
RD6. I don't particularly care for it.
RD7. --

PP5. The principal problem for me, other than the difficulty in adjusting to the machine, would be in note taking. Why take notes, thus slowing reading, where underlining and jotting notes in the margins is just as profitable?
PP6. --
PP7. Unappealing--from the point of view of not having material available at home.
PP8. Seemed too distant to concentrate.
PP9. I would rather read in the Reserve Room; it's easier to relax.

Viewer Use = 1-10%

RD8. I don't like not having the material available to study from for a test the next day or something.
RD9. I like to get close to the work and follow it with a pencil; obviously, this was impossible.

Viewer Use = 1-10% (Cont.)

RD10. If this is the only means I am against it, but combined with lectures it would be excellent.

RD11. --

RD12. Neutral.

RD13. You can't take it home with you, doodle on it or even feel personally attached to it. Supposing everyone was very on to the machine, how would you apportion your time around the hours of a machine?

RD14. Doesn't affect me one way or the other.

RD15. Machine--fatigued eyes. Uncomfortable.

RD16. Obtaining material from a machine is very impersonal. A book is something that belongs to you and is there all the time.

PP10. --

PP11. I would rather read the material off of a printed page that I could underline and make notes off of, and be able to refer back and forth without losing my place.

Viewer Use = 11-20%

RD17. I felt somehow pressured to go quickly.

RD18. I am neutral.

RD19. I'm just too used to books; otherwise, no bother.

RD20. I enjoyed working with the machine--new experience.

PP12. Unappealing because it's a machine and one can't ask questions.

Viewer Use = 21-30%

RD21. Very impersonal.

Viewer Use = 31-40%

RD22. --

RD23. I like to have books as my property.

RD24. The machine was uncomfortable to use. There is something satisfying about turning pages.

Viewer Use = 31-40% (Cont.)

RD25. It gave me a headache.

PP13. I didn't like the noise from the machine.
PP14. --

Viewer Use = 41-50%

None

Viewer Use = 51-60%

RD26. Too small print on some of the articles presented the only real problem.
RD27. I'm indifferent.

Viewer Use = 61-70%

RD28. --

PP15. Unappealing, but this due to the content of the material also.

Viewer Use = 71-80%

RD29. I hate having to look up at the material when taking notes.
RD30. Good--because it was easy, but I really dig reading regular books.
RD31. It is fun for awhile and would be a good supplement to a textbook.
RD32. --
RD33. --

PP16. Fair--would just as soon use a book.

Viewer Use = 81-90%

RD34. I had to make time to go to the library, whereas a book you can pick up at any time. I do not like not having the texts to refer back to or own.

Viewer Use = 91-100%

None

Question 7

Do you have any recommendations for the improvement of the Viewer-Fiche System?

Viewer Use = None

RD1. --
RD2. --

PP1. If the reader had been demonstrated, I might not have found so many excuses not to use it. Really like the idea of the reader, just ended up always using reserve material.
PP2. --
PP3. --
PP4. --

Viewer Use = Once

RD3. Destroy it!
RD4. --
RD5. Need an underliner on the machine.
RD6. --
RD7. Get rid of it!

PP5. Get different machines; or better still, provide every student with a machine.
PP6. --
PP7. Focus.
PP8. Make it into something like a pencil pad that you can keep on the table like a notebook.
PP9. --

Viewer Use = 1-10%

RD8. I don't know if it's possible but I'd like it better if it was flat on the table.
RD9. Discard it!
RD10. Not the system, but with the readings--they were too many and too much.

Viewer Use = 1-10% (Cont.)

RD11. Make so that you can look down on it as you do a book and find a way to keep it in focus.

RD12. Increase resolution to cover half-tones and provide better general resolution.

RD13. Tell it to self-destruct. Get better focus and larger screen. Start using these teaching methods earlier if they must be used.

RD14. --

RD15. --

RD16. --

PP10. Individual machines available 24 hours a day.

PP11. --

Viewer Use = 11-20%

RD17. No, but I hope it won't be necessary to resort to its use in the future.

RD18. More of them--better lighting and better photography.

RD19. Slant it back a little. Better focus mechanism.

RD20. Lighting could be improved.

PP12. More.

Viewer Use = 21-30%

RD21. None.

Viewer Use = 31-40%

RD22. --

RD23. --

RD24. Better focus.

RD25. Cut down on amount of material presented this way for awhile--say, give Freshmen 1/3 of their study load this way--when they are Sophomores 1/2--Juniors 3/4--Seniors 100%.

Viewer Use = 31-40% (Cont.)

PP13. I don't think it was too good.
PP14. Bag it.

Viewer Use = 41-50%

None

Viewer Use = 51-60%

RD26. No, I think I could adapt to the system if I had to.
RD27. No.

Viewer Use = 61-70%

RD28. Already stated. (fatigue, looking from reader to paper)

PP15. Give them to IBM so the computers can read in their spare time.

Viewer Use = 71-80%

RD29. --
RD30. Keep the lights out.
RD31. No.
RD32. None really.
RD33. None except focus.

PP16. --

Viewer Use = 81-90%

RD34. Change angle of screen

Viewer Use = 91-100%

None

Question 8

Until the Woodstock-Kent State Crisis (which corresponded to the mid-term for this class), the use of the Viewer-Fiche System and the Reserve Room was high. Since that time, use has deteriorated. Can you give any insights into why?

Viewer Use = None

RD1. Generally, people seem to prefer Reserve Room to fiche and availability of printed material became more apparent. I didn't ever use fiche because of the number of complaints and loss of cards.

RD2. Most people just got very involved in Woodstock--pro or con. This became the most relevant topic of discussion. Classwork at the time was of second importance.

PP1. --

PP2. Decline in pressure.

PP3. --

PP4. General frustration.

Viewer Use = Once

RD3. The readings have been easier and less detailed. As the quarter went on more people found out that the Reserve Room was easier. It became apparent that there were more important things in this world than nerve endings.

RD4. There has not been as much reading assignments and possibly due to end of quarter, people have just neglected filling out cards.

RD5. Only 3 quizzes are going to count for our grade.

RD6. Perhaps because of the changed grading system. If people did reasonably well up to that time they maybe feel they can slack off and still get a passing grade.

RD7. I personally became depressed and discouraged and disgusted and as a result I have had a very hard time studying anything since the strike.

PP5. --

Viewer Use = Once (Cont.)

PP6. At times the hypocritical actions of some; i.e., administrators, makes it extremely hard to rationalize why one should be studying something as abstract as sensation and perception instead of attempting a rational change in society. Therefore, when 1,000 National Guardsmen are sent to campus by Mitchell, the whole ideal of academic somewhat turns my stomach.

PP7. Several people might have xeroxed material. I feel that people lost impetus for doing work related to courses after this crisis--a feeling that the quarter had come to an end unofficially, with more time given to conversation, reading about political atmosphere--National Guard!

PP8. I think for my section this is not true. Only recently have I seen people from my section in library. Also I believe some people have dropped course. Also, is close to end of school.

PP9. The reading list was cut down--trying to make time for both the experiment and the reading was difficult.

Viewer Use = 1-10%

RD8. There was quite a bit less reading material after the strike.

RD9. Lack of motivation towards relatively unimportant school work.

RD10. Tension was high--a sort of mass Paranoia--also you can't use the reader anytime you want to.

RD11. Possibly less signing in, but probably because less reading was done in general.

RD12. --

RD13. --

RD14. Very difficult to concentrate and study during and immediately after Woodstock. Whole campus was disrupted. Also, I know of several persons, myself included, who elected not to take one of the quizzes for various reasons.

RD15. Not as much reading--might have slacked off on filling out sheets.

RD16. It was very difficult to study let alone hassle with using the fiche system.

Viewer Use = 1-10% (Cont.)

PP10. --

PP11. The Woodstock-Kent deal was very disrupting and probably caused a break in interest over the reading. Also, it could be that many students had xeroxed off the material and read it at home after midterms.

Viewer Use = 11-20%

RD17. --

RD18. Poor quality of the photographs.

RD19. I don't feel it had anything to do with Woodstock; many of us just wanted to try out the reader at first, but got disgusted with it and gradually stopped using it.

RD20. There hasn't been as much material to cover, which would eliminate time spent reading it--only 3 quizzes are recorded, people might be happy with 3 previous grades.

PP12. It is hard to study books when so much environmental learning is taking place and I feel the environmental is more important.

Viewer Use = 21-30%

RD21. People just can't get into studying.

Viewer Use = 31-40%

RD22. I wanted to use the fastest and easiest way possible. I used only readers prior to that time and only Reserve Room after that time.

RD23. --

RD24. Pass/Fail possibility--sick of this course.

RD25. I began working on a job about that same time.

PP13. --

PP14. --

Viewer Use = 41-50%

None

Viewer Use = 51-60%

RD26. The remaining reading material was too small in print to read on the reader.

RD27. People lost interest in studying because they had been relieved of the necessity of doing so by the strike, the relaxation of pass/fail requirements, and the teacher's lessening work load.

Viewer Use = 61-70%

RD28. Lost card.

PP15. The machine is part of the system; at the time of the strike the system was very unpopular to say the least.

Viewer Use = 71-80%

RD29. Probably because many people are talking pass/fail and don't need to study as hard.

RD30. I guess people don't like to read until the pressure's on, but I really don't know why.

RD31. Lack of interest in studying.

RD32. Loss of interest.

RD33. Because I was on strike against this racist, oppressive society until several days ago. I've still missed 2 quizzes and the midterm, but these other issues have a higher priority than reading about decade-old rat-runner experiments.

PP16. The final exam hasn't been given. I would assume use to increase at this time.

Viewer Use = 81-90%

RD34. The amount of reading after this time decreased in amount. It is spring and people care less, especially after not working for a week and a half of the strike.

Viewer Use = 91-100%

None